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NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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Duty on Hydrocarbon Oils

WE have received from a chemical correspondent some interesting comments on the editorial note we published last week on "Illogical taxations" in relation to the duty on turpentine. The point in question is largely a matter of legal interpretation, and the definition to be kept in mind is that given in Section 2, Paragraph 9, of the Finance Act, 1928:—

In this Act the expression, "Hydrocarbon oils" means petroleum oils, coal tar, and oils produced from coal, shale, peat or any other bituminous substance and all liquid hydrocarbons.

The expression "all liquid hydrocarbons" has been emphasised because it seems clear that turpentine, which is a hydrocarbon and a liquid, is included. This definition is, of course, the definition of those oils that are liable to duty, but a rebate of the duty is given, except for that portion of the field which falls within the definition given for light oils. Here, again, turpentine complies with the definition given in the Act. It therefore seems to our correspondent that the duty on turpentine cannot well be queried on the grounds of legal interpretation.

It is, of course, clear that there are a number of other liquid hydrocarbons, such as certain essential oils, which also fall within the scope of the duty. This

was realised by the Association of British Chemical Manufacturers as soon as the duty was imposed; the matter was taken up at once with the Customs and exemption was obtained for all essential oils complying with the light oil definition, except turpentine, which Mr. Churchill stated in his Budget Speech he definitely included. It is not to be presumed that the chemical manufacturers welcome the duty on turpentine; their difficulty appears to be to know how it can be opposed on legal grounds. Representations, we have reason to believe, are being made on the subject in the hope of getting an amendment moved at the Committee stage of the Finance Bill, whereby turpentine when used for chemical manufacture as an essential raw material, viz., camphor and terpineol, may be allowed a drawback equal to the rate of duty.

Safety in the Chemical Industry

IT was an excellent idea to organise a chemical section in connection with the National Safety Conference held at Leeds last week, and the experiment more than justified itself. The chemical industry has its own peculiar risks, against which works inspectors, employers, and workmen themselves desire the most effective protection. Curiously enough, it is the workmen, although they are the first to suffer, who often show the greatest indifference to danger and are most reluctant to adopt the protective measures recommended or enforced. All parties, however, stand to gain by the reduction to the lowest point of the risks incurred in conducting chemical operations and processes, and need to have this impressed on them.

The Chemical Session at Leeds was organised by the Association of British Chemical Manufacturers, the source of most of the initiative witnessed in recent years, and the chairman, Dr. E. F. Armstrong, presided. The subject selected for discussion was the cleaning and repair of plant and vessels containing dangerous materials—a problem of general interest to industry, but of special interest to chemical industry, as some recent occurrences have shown. It was introduced by Mr. J. Davidson Pratt, general manager of the Association, in a concise and comprehensive paper, the substance of which is published on another page. Three essential conditions were insisted on: (1) the isolation of vessels from every source of dangerous material; (2) the thorough cleansing of vessels; and (3) a final inspection and certification by some responsible person. Special emphasis was laid on the importance of providing for repair and cleaning operations in the design and layout of the plant.

Mr. Davidson Pratt's introductory contribution was followed by a series of others, of which we hope to publish summaries in future issues. Mr. H. C. Dungey (Yorkshire Tar Distillers), dealing with the subject of

tar stills, emphasised the importance of top and bottom manholes in all vessels which workmen are required to enter. Mr. G. B. Jones, works manager of the Dalton works of Imperial Chemical Industries at Huddersfield, dealt with the practical measures adopted in the dye-stuffs industry, where a wide range of materials is involved. Mr. D. Crockatt (John Crockatt, Ltd., dyers and dry cleaners), discussed the special problems of the dry cleaning industry which arise from the inflammable and toxic nature of the spirit used, and advocated the use of white spirit as a means of reducing these risks. Dr. J. A. Lloyd (Courtaulds, Ltd.), dealt with the problems of the artificial silk industry, with special reference to acids and carbon bisulphide. The varied problems with which the Billingham factory of Imperial Chemical Industries has to deal were briefly explained by Mr. Woods, the Billingham safety officer, and special attention was drawn to the methods to be used in dealing with high-pressure plant, which presents a number of problems not normally encountered in the rest of the chemical industry. Mr. L. C. McNair, H.M. Engineering Inspector, Factories Department of the Home Office, mentioned various problems of the type under discussion arising in connection with blast furnaces, acetylene generators, gas holders, ships' oil tanks, and the ordinary motor car petrol tanks. It will be seen how thoroughly and comprehensively these important subjects were considered and the volume of expert experience the conference brought to bear on it. The organisers may be congratulated on the excellent results of their experiment.

Aluminium in Architecture

THE Empire State building, on Fifth Avenue, New York, which has just been completed, affords an even more remarkable example of the application of aluminium to architecture than the Chrysler building, which it surpasses in height. On the roof above the 80 odd stories there is being constructed a steel tower, over 200 ft. high and intended as an observation tower and airship mooring mast. The top is 1,248 ft. above ground level and the whole is being given a striking appearance by sheathing with aluminium alloy. About 150 tons of castings and extruded shapes in a silicon (5 per cent.) alloy are being used for this purpose. Besides covering the entire tower, except for alloy steel strips between the windows, this light alloy is also being employed in a stairway leading into the tower, in large wings built up of castings at the corners, and for the window casements and sashes, these being highly polished to contrast with the frosted finish of the rest. To obtain the desired colour for the aluminium alloy covering the tower, the pieces, some of which are 5 ft. by 8 ft., and even larger, are individually sand-blasted by means of special apparatus, medium-grain sea sand being used to provide a fine-grained frosted finish. This treatment is followed by hand spraying with a special preparation to retain the colour obtained. Altogether about 380 tons of light metal are being embodied in the building, in the form of store fronts, marquises, lift doors, observation tower, and 5,704 spandrels. The last are anodically treated to give a dark grey finish, and are set in vertical lines beneath

the windows, separated from the vertical lines of white stonework by strips of polished stainless steel.

The extraordinary rapidity with which light metals have gained popularity in the United States as architectural materials is shown by the number of recently constructed important buildings, in the decoration of which the new materials play a large part. This movement, although hitherto practically confined to the United States, now shows signs of spreading to Canada and Europe. A notable feature of the new building of T. Eaton and Co., in Toronto, is the use of light alloy castings for the cresting details, while cast aluminium spandrels are used on the Office Speciality Manufacturing Co.'s building in Montreal. Interest in the wide possibilities of the new medium is now being aroused in British and Continental architectural circles. The perfecting of various processes, notably anodic oxidation, to enable light metals to be provided with various finishes and colourings, together with the development of light alloy structural pieces, may soon provide the architect with commercial products in aluminium which will give him still greater scope in his designs and enable him to use the light rustless metal for further numerous purposes for which it seems particularly suited.

Books Received

- SPECTRUM ANALYSIS IN MINERALOGY. By A. A. Fitch. London: Adam Hilger, Ltd. Pp. 52. 1s. 11d. post free.
- ANNUAL REPORTS ON THE PROGRESS OF CHEMISTRY FOR 1930. London: The Chemical Society. Pp. 390. 10. 6d.
- INDEX TO CHEMICAL ABSTRACTS, 1930. London: The Bureau of Chemical Abstracts. Pp. 704.
- OFFICIAL CHEMICAL APPOINTMENTS. London: The Institute of Chemistry. Pp. 402. 5s.
- RADIOELEMENTS AND ISOTOPES: CHEMICAL FORCES AND OPTICAL PROPERTIES OF SUBSTANCES. By Kasimir Fajans. London: McGraw-Hill Publishing Co., Ltd. Pp. 126. 12s. 6d.
- AN OUTLINE OF THE UNIVERSE. By T. G. Crowther. London: Kegan Paul, Trench, Trubner and Co., Ltd. Pp. 376. 12s. 6d.
- THE WATER GAS PROCESS: A STUDY OF THE CARBON AND THERMAL BALANCES. Department of Scientific and Industrial Research. Technical Paper No. 30. London: H.M. Stationery Office. Pp. 31. 9d.
- RAPPORTS SUR LES HYDRATES DE CARBONE (GLUCIDES). DIXIEME CONFERENCE DE L'UNION INTERNATIONALE DE CHIMIE. Paris: Union Internationale de Chimie. Pp. 286. 50 francs (or 9s.). Obtainable from Hachette and Co., H. K. Lewis and Co., and David Nutt, London.
- REPORT OF THE BRITISH ECONOMIC MISSION TO THE FAR EAST, 1930-31. Department of Overseas Trade. London: H.M. Stationery Office. Pp. 156. 2s. 6d.
- SOLVENTS. By Thos. H. Durrans. (Second and revised edition). London: Chapman and Hall, Ltd. Pp. 180. 10s. 6d.

The Calendar

May 27	Ceramic Society: Annual Meeting. 7.30 p.m.	North Staffordshire Technical College, Stoke-on-Trent.
June 4	Chemical Society. 8 p.m.	Burlington House, London.
5	Physical Society. 5 p.m.	Imperial College of Science, London.
10	Faraday Society: Annual General Meeting: "A Laboratory Study of the Atmospheric Corrosion of Metals." "An Air Thermostat for Quantitative Laboratory Work." Dr. W. H. J. Vernon. "The Quantitative Humidification of Air in Laboratory Experiments." Dr. W. H. J. Vernon and L. Whitby. 8.15 p.m.	Burlington House, London.

The Care of Platinum Laboratory Ware

By D. Jennings

Platinum is a metal which demands special care when in use in the laboratory. The following notes have been gathered together chiefly for the benefit of those who are constantly using platinum crucibles and basins, but they may be profitably studied by all laboratory workers.

PLATINUM is not attacked by *unmixed acids in the pure state*, but it is readily soluble in *aqua regia* and to a certain extent in other solutions in which free chlorine is present. The caustic alkalis and alkaline earths (especially the hydroxides of barium and lithium), sulphates, nitrates and cyanides, attack it at a red heat, but the alkaline carbonates have no effect even at the highest temperatures. It is corroded by sulphur, phosphorus and arsenic, and by compounds containing these elements (sulphides, phosphates, arsenides, arsenates), especially in the presence of a reducing agent. In consequence, phosphates and arsenates should never be ignited in platinum crucibles with their filter papers. Peroxides, and "per-salts" generally attack platinum and tend to render it permanently brittle. Silicon, which may be formed by the reducing action of carbon on silica, will also cause brittleness.

Although oxidised by fused potassium nitrate, fused potassium bisulphate does not attack the metal and is therefore a useful material for cleaning dirty crucibles and basins, and a permissible analytical reagent for dealing with insoluble residues by fusion. Fused ammonium sulphate and the halogen salts of the alkali metals have little or no action, but a mixture of ammonium sulphate with ammonium bromide or potassium bromide will corrode platinum and platinum alloys very quickly and care should be exercised in the examination of products where the presence of bromine is suspected.

Similar precautions should be observed in heating compounds of easily-reducible metals in the crucible, for lead, tin, zinc and antimony give fusible alloys at comparatively low temperatures. If the presence of these metals is suspected, nickel crucibles should be used in the place of platinum crucibles. Platinum does not amalgamate with mercury, however, except in the presence of sodium.

Action of "Reducing" Flame

When platinum is heated in the inner cone of the Bunsen flame, the carbon, which is present in the flame, combines with the metal to form a porous, sooty deposit which ultimately causes brittleness and general deterioration. Impure platinum containing iron or rhodium is especially susceptible to this form of deterioration, which is primarily due to the presence of carbon disulphide in the coal gas. No actual deterioration results by heating crucibles in the non-luminous flame, but they may lose or gain weight to an appreciable extent, if conditions for the oxidation of traces of impurities at the surface of the metal are favourable. The power of the metal to occlude gases may also be partly responsible for this alteration in weight, which is especially noticeable where crucibles are used exclusively for the determination of volatile matter in coal. Sulphur-free flames are harmless.

Platinum-Iridium Alloys

Being a relatively soft metal, pure platinum is generally alloyed with a small percentage of iridium to give commercial hardness to the articles made from it. This hardness increases with the proportion of iridium present, the Brinell number being 85 for the 5 per cent. alloy and 260 for the 30 per cent. alloy. For crucibles, however, the iridium content should be very low, especially in cases where the crucibles are to be used at high temperature. Experiments carried out at the U.S. Bureau of Standards have proved that platinum containing appreciable amounts of iridium begins to show a serious loss in weight when heated to 900° C., and that this loss increases rapidly as the temperature rises.* It has therefore been recommended that platinum used for crucible ware should not contain more than 0.3 per cent. of iridium.

Platinum with more than 10 per cent. of iridium is noticeably resistant to those reagents which exert a decided action

upon the pure metal; such alloys are therefore desirable for basins, dishes and similar apparatus. The alloy with 10 per cent. of iridium is slowly but completely soluble in hot *aqua regia*, but richer alloys are scarcely attacked even on prolonged action.

Methods for Cleaning

The frosted appearance produced upon the surface of platinum by the action of the Bunsen flame can be removed only by burnishing the metal. This should be done periodically, for although the porosity is only superficial at first it will sooner or later extend to the interior of the metal if unchecked.

The cleaning and polishing of platinum crucibles and dishes immediately after use will considerably lengthen their life. Moist sea sand, applied with the finger, may be used for polishing purposes, but care must be taken to see that this sand consists entirely of *smooth* grains, quite free from angular particles which would cause loss of weight by abrasion. For cleaning, potassium bisulphate (or borax) may be fused in the crucible, which is then placed in boiling water to dissolve the fused salt, and subsequently polished with the moist sand.

Sodium amalgam is also a useful material for cleaning platinum ware, more especially in cases where base metals have alloyed at the surface of the platinum.† The amalgam is gently rubbed over the surface of the crucible with a cloth and is then moistened with water, thus oxidising the sodium and leaving the mercury free to amalgamate with any base metals which are present; the mercury is then wiped off and the crucible is polished with moist sand and heated to redness to drive off any mercury which has amalgamated with the platinum in the presence of the sodium.

Platinum crucibles which have become stained with coal ash lose these stains when used in the determination of ash in coal-tar pitch. Stains produced in the analysis of leather for "total sulphuric acid" (Balland and Maljean's method), and in the estimation of ash from "total soluble matter" in tannin products, can be removed by covering the stain with a mixture of sodium bicarbonate (2 parts) and borax (1 part) and gently fusing it and then treating it with hot water. Platinum wire contaminated with copper, barium or analogous substances, by use in flame tests and in spectroscopic work, may be cleaned by means of a borax bead which is allowed to pass up and down the wire until the offending impurity has been dissolved in it. The bead is then shaken off at the end of the wire, and the remainder of the borax is volatilised in the flame or removed by hot water. In some cases microcosmic salt proves to be slightly better than borax.

Repairing Small Cracks

"Cracking" is still a defect of some platinum ware. This tendency to develop small cracks after continued heating appears to take place more frequently in crucibles used for the determination of volatile matter in coal and similar materials, but it also occurs in platinum basins. Such cracks may be repaired by laying a small piece of sheet gold upon the defective place on the *outer* surface of the inverted crucible or basin, which is then heated from the inside by means of the blowpipe until the gold melts and effectively seals the opening. Platinum ware which has been repaired in this manner is capable of withstanding the heat of a large Teclu burner for half-an-hour without loss in weight. Large cracks should be closed as far as possible by hammering, before proceeding to seal them by this method.

† If the presence of a base metal alloy is suspected, the crucible should be immersed in boiling hydrochloric acid for a few minutes, thoroughly rinsed in successive changes of clean water, and then immersed in boiling nitric acid (which has been tested for freedom from chlorine). If unaffected in weight after this treatment, and the acid baths fail to give reactions for base metals, the absence of a base metal alloy is confirmed.

* Report of the Committee of the American Chemical Society on the Quality of Platinum Laboratory Utensils, 1911; Reports of Bureau of Standards, 1915 and 1916.

Cleaning and Repair of Chemical Plant and Vessels

By J. Davidson Pratt

We give below the substance of the paper on "The Cleaning and Repair of Plant and Vessels containing Dangerous Materials" presented by Mr. J. Davidson Pratt (general manager of the Association of British Chemical Manufacturers) at the Chemical Session of the National Safety Week Congress on Tuesday, May 12, Dr. E. F. Armstrong in the chair.

THE main statutory requirements in regard to the entering of vessels containing dangerous materials are set forth in Regulations 7 and 8 of the Chemical Works Regulations, 1922 (Statutory Rules and Orders, 1922, No. 731), issued by the Home Office, and applying to the manufactures and processes incidental thereto carried on in chemical works. These regulations do not specifically mention the need for the thorough removal of dangerous material before the entry of unprotected workmen is permitted, though this is obviously implied; and since misunderstandings have arisen on this account, the Association of British Chemical Manufacturers has, in the Model Safety Rules which it has issued to its members, amplified the first sentence of Rule 7 so as to provide for this.

Risks and Precautions

The hazards that may arise from the presence of dangerous material in plant or vessels may be broadly divided into three classes, namely:—

(i) Fire and explosive risks occurring with substances such as acetylene, petrol, benzol and hydrogen (as in acid containers).

(ii) Gassing risks due to inhalation, whether of gas, vapour, fumes or dust, with substances such as chlorine, sulphur dioxide and compounds of lead and arsenic. Under this head can be included the dangers which arise from an insufficiency of oxygen.

(iii) Corrosive risks due to action on the skin by substances such as strong acids, amido derivatives and hot liquids.

In many cases more than one type of hazard may be present, for example, with benzol and carbon disulphide, where there is a gassing risk as well as a fire risk.

The main precautions to be observed may be summarised as follows:—

(i) For fire and explosive risks, all possible sources of ignition such as naked lights, flames, sparks or friction should be eliminated. With vapours that have a low ignition point, for example, with carbon disulphide, even a warm lamp, though fully enclosed, may cause ignition.

(ii) For gassing risks, adequate ventilation is the main safeguard, but breathing apparatus or respirators may be required where this cannot be assured.

(iii) For corrosive risks, contact of the skin with the dangerous material should be avoided.

In addition, a basic precaution is to prevent the escape of dangerous material into any room or place in which men are working.

The preparation of a vessel or a portion of a plant for inspection or repair may involve all or some of the following definite steps, according to the circumstances:—

(a) The isolation of the vessel from every possible source of dangerous material.

(b) The thorough removal of the dangerous material by appropriate methods of cleaning.

(c) A final inspection and certification by a responsible person to ensure that the vessel is free from danger.

The precise nature of the operations to be followed will vary with the type of plant and the dangerous material in it.

Isolation and Cleaning of Vessels

It is essential that steps should be taken to ensure that dangerous material, whether solid, liquid or gas, should not be able to find its way into the vessel to be examined or repaired while the work is in progress. The safest course is to disconnect the vessel completely from every other piece of plant and to blank off all the inlet pipes with a metal blank having a large indicator lip, the blank being bolted with a properly-made joint. This is what is invariably done in connection with the cleaning of tar stills. The mere closing of cocks and valves cannot be considered a satisfactory isolation. If, however, complete disconnection is impossible, the controlling valves in the connecting pipes must be properly closed and locked, so that they cannot be opened inadvertently while the

work is in progress. Many fatal accidents have occurred from neglect of this precaution. It is also necessary to ensure that men are not allowed to enter any apparatus which can turn itself or is provided with power-driven machinery, until safe measures, e.g., by dismantling belts or by locking, fastening or blocking all the gearing arrangements, have been taken to prevent the starting of the machinery by itself or otherwise.

The thorough cleaning of the vessel is of prime importance. The basic consideration is to obtain the complete removal of the dangerous material, whether solid, liquid, gas or dust, before the work of repair is commenced. This will often present difficulty in that the dangerous material may be trapped in the sludge, scale or other deposit, or in brickwork, and may only be released when the work of repair commences; similarly, dangerous material may lodge in bends of connecting pipes or similar places where removal is difficult. Special care must, therefore, be taken in such cases, and the cleaning process may have to be repeated to ensure that all danger has been removed.

The method of cleaning to be employed will depend on the nature of the material in the vessel, but steaming will generally be found to give satisfactory results. This method is, of course, particularly applicable with steam-volatile products. Partly filling with water and boiling may often be a satisfactory substitute for steaming. If the dangerous material is valuable and must be recovered, or is not readily volatile or is corrosive, a preliminary treatment by repeated washing with small quantities of water or other suitable solvent or neutralising agent may precede steaming. The steaming must in all cases be adequate, and observation will often show whether all the volatile material has been removed. Where there is solid matter at the bottom of the vessel, a perforated steam pipe should be used to stir up the deposit and assist the removal of the dangerous material. Where there are attachments to the vessel, such as a condenser to a still, care should be taken to see that these are fully cleaned by the steaming. Where plant cannot be opened up directly to the atmosphere, it may be necessary to steam at reduced pressure in order that the safe working pressure be not exceeded. It may be necessary in special cases to use solvents or neutralising agents to get completely rid of the dangerous material.

When the steaming or other method of cleaning has been completed, all the liquid in the vessel should be run out immediately, and the manholes should be opened while the vessel is still hot, so that it may be well ventilated to remove dangerous vapours. Where natural ventilation, assisted if necessary by a windsail, is not adequate, artificial ventilation by a blower or an exhaust fan, or by compressed air may be used to get rid of all dangerous vapours. If the vessel is still not free from dangerous material, the processes of cleaning and ventilating should be repeated until the result is satisfactory.

Certification that the Vessel is Safe

After the vessel has been thoroughly cleaned and ventilated as has been indicated, it should be inspected by a responsible person, who should carry out the following tests:—

1. *Explosive Risks.*—Where explosive risks are involved, a useful means of test is the Redwood vapour lamp, made by W. J. Fraser and Co., Ltd., Dagenham, Essex, in which the proportion of inflammable vapour is estimated from the size of the flame cap over a hydrogen flame. There are other devices on the market for achieving the same object, but great care should be exercised in their employment, as some of them are not sufficiently sensitive for general use and may be liable to vary in their readings when in operation. In carrying out the test, special attention should be given to the bottom of the vessel and to corners and pockets where the vapour may settle or be trapped. In the event of repairs extending beyond a period of 24 hours, such tests should be repeated at the discretion of the supervisor each morning before work is started or during the day if there is a material change in temperature.

The person carrying out the inspection should certify in

writing that there is not sufficient vapour present to propagate flame and that the tank or vessel is entirely isolated and sealed from any source of such vapour or gas and is free from danger. Unless this has been done, no person must be allowed, on any account, to bring near any naked light or flame and only a proper safety lamp protected against breakage should be used in making any inspection. In all cases where safety lights have to be used, no work should be done with tools that might give rise to sparks.

2. **Gassing Risks.**—If it is intended that an unprotected person should enter the vessel, the responsible person must carry out a further test by lowering a cage of white mice into the vessel; if the mice are in a normal condition after being five minutes in the vessel, the necessary certificate under Chemical Works Regulation No. 7 should be given, and men may then be allowed to enter. The mice should thereafter remain in the vessel so long as men are there, and the condition of the mice should be observed at frequent intervals.

Precautions when Entering a Vessel Not Certified

In cases where it is necessary for any person to enter the vessel, whether for inspection or for the removal of sludge, deposit, tar or scale before the conclusion of the white mice test above, he must wear approved breathing apparatus, provided with a length of inhalation tubing, the free end of which is outside the vessel, and a life-belt, the free end of the line attached to which must be held outside by a man remaining in attendance the whole time there is anyone in the vessel. It is essential that the breathing apparatus and life-belt should comply with the requirements of such apparatus, given in the Chemical Works Regulations, 1922. An oxygen recovery apparatus ready for immediate use should be available near the operation, where risk of asphyxiation or poisoning exists. Care must be taken where there are heating or cooling coils or other obstruction in the vessel, that the life-belt or the limbs of the individual do not become entangled.

Before men enter a vessel without breathing apparatus, artificial ventilation should be applied, unless there is adequate natural ventilation, and should be continued the whole time to ensure that any noxious gas or vapour that may be evolved is immediately removed. The men should always wear life-belts, and an attendant should be on duty outside the whole time. When working inside vessels, no lamp must be used the fuel of which, if spilt or allowed to run out, might evaporate or give rise to explosive gas mixtures. Benzine, ligroin or petroleum are not permissible in this connection.

Where Entry into Vessel is Unnecessary

When it is not necessary to enter the vessel, it may be possible, under exceptional circumstances, where facilities are available, to ensure safety from ignition during repair by injections of an inert gas, provided precautions are taken to ensure that sufficient inert gas is used and that it is not allowed to leak unduly while the repair operations are being carried out, and that a relief is provided to prevent bursting of the vessel due to heat expansion of the contained gas. This method is subject to many limitations and would have to be used with great caution.

When the vessel to be repaired is in close proximity to another vessel with a fire or explosive risk, it may be necessary in the interests of safety to free the second vessel from all explosive or inflammable vapours before the work is begun, particularly if the repair involves operations requiring a blow-pipe or other flame.

Circumstances may, of course, arise in which small repairs must be carried out while the plant is running. In such cases, the work must be done only by a competent person under skilled supervision. It is not advisable, in the interests of safety, to attempt any repairs on lines or apparatus under pressure. This applies also to tightening up flanged fittings. The unusual strains produced while the repair is under way may easily cause a serious accident.

Repair of Lead-lined Apparatus

Special mention must be made of the dangers that may arise in the repair of apparatus that has been lined with lead to prevent corrosion by acids or other corrosive materials used in it. Blistering of the lead may occur as the result of the percolation of small quantities of the contents of the apparatus through defective parts of the lining, with consequent attack of the underlying metal and the generation of gases, such as hydrogen, the pressure of which thrusts the lead away from

the walls. In repairing these defects, care must be taken to avoid striking the blistered spots and the use of soldering lamps or other open light must be strictly prohibited, otherwise explosions of great violence may occur. The apparatus must, of course, be well ventilated before repairs are commenced.

In one very serious instance of this kind, the workmen, who were using an open soldering lamp in a tank, were literally sheathed in the lead blown away by the explosion. The metal had to be cut away in pieces to reach the two bodies.

Cleaning of Drums and Containers before Repair

Many accidents occur in the repair of drums and other containers which have held petrol, benzol, and similar liquids, or drums which have contained acid, because the precaution of cleaning and ventilating them beforehand has not been observed. Except in the case of liquids that mix easily with water, such as methyl alcohol, ethyl alcohol and acetone, washing out with water is quite insufficient to remove the residue of an insoluble solvent adhering to the interior of a drum. Washing with running water, maintained for twenty-four hours, followed by a good airing, might possibly succeed; but it is decidedly preferable to clean drums by means of a large steam spray applied as long as the steam shows any traces of the solvent, which can often be easily detected by its smell. Steam under high pressure should not be used, as accidents have arisen from burst containers where there was not an adequate exit for the steam. If these precautions are not taken, it happens only too often that when the containers are attacked with the blow-pipe of an autogenous welding outfit, or even with a chisel or a hammer, they explode as the result of the ignition of the mixture of the air and vapour composing their internal atmosphere.

This indicates the need for care in the removal of bungs, which may have become stuck owing to corrosion or other cause. Where sparks might be dangerous, a bronze chisel should be used to loosen the bung, while steam heat should be tried rather than heated metal objects. If a heated metal object is employed, it should never be red-hot. It is also a wise precaution to apply a steam jet inside the drum for a short time immediately before using a blow-pipe or cutting tool, even though the container may previously have been cleaned by steaming.

Design of Vessels

It will be clear from the foregoing that the cleaning of vessels may be greatly facilitated by careful attention to the design, particularly where it is necessary for men to enter them. The first point to stress is that the manholes should be of adequate size, not merely to allow a man to enter, but also to permit of the easy removal of an unconscious man. Many accidents have had a fatal termination because it was impossible to get the unconscious man out in time. Furthermore, the positions of the manholes are important. The old practice was to rely on a single manhole in the top, with merely a run-off pipe in the bottom. This arrangement was not conducive to easy cleaning or ventilation of the vessel, while rescue operations were attended with considerable difficulty and danger. Many firms have now adopted the practice of having both top and bottom manholes in all vessels which have to be entered, and this arrangement has been found to simplify the cleaning operations considerably, and to ensure greater safety to the workers. The practice is, therefore, to be strongly recommended in view of its great merits. The minimum size of manhole for safety has not yet been settled, but a committee of the British Engineering Standards Association has recently undertaken to investigate this subject.

Qualifications of Repair Men

In conclusion, emphasis must be laid on the fact that few employees are exposed to greater or more varied hazards than are maintenance and repair men. The dangers inherent in such work make it necessary for the men to use all their faculties in the performance of their duties to avoid injury to themselves and to others working with them. Every effort should be made to educate these men in their responsibilities and to make them appreciate the need for the various precautions. In the majority of accidents it is the human element that is at fault and the successful maintenance of safe methods of working can only be assured by the fullest co-operation of all concerned in seeing that the necessary precautions are known, fully understood and loyally carried out by everyone connected with the plant or factory.

A Survey of the Chemistry of Natural and Synthetic Musk Substances.—(II)

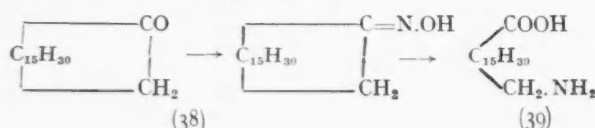
By G. Malcolm Dyson, Ph.D., A.I.C.

THERE are one or two points about the odour of these cyclic ketones that are of interest. In the first place it is interesting to note that the ketone with thirteen members in the ring has an odour of cedarwood, but more important is the intense and natural musk odour associated with the ketone of fifteen carbon atoms. This odour very closely resembles that of natural musk, which, as will be seen later, has an analogous constitution. On the other hand, the cyclic ketone with fourteen atoms in the ring, although of an intense musk odour, is also possessed of an unidentified accessory odour which is different from that of natural musk. The fifteen carbon atom ketone is the "Exaltone" of commerce and can be used to replace the natural variety without prejudicing the result. Again, the cyclic ketone with seventeen atoms is very much like civet in odour. Finally, the odour decreases very rapidly as the number of carbon atoms is increased beyond seventeen, and with very large rings, such as those containing 30 atoms, smell is not apparent.

Civet

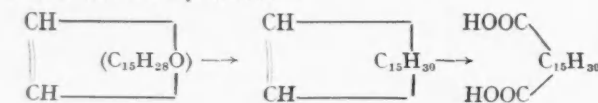
In 1900, Walbaum(13) discovered that scatol was one of the constituents of the civet of commerce, and that a ketone was present which had the empirical formula $C_{17}H_{30}O$, while Sack(14) in 1912 isolated this substance in about 3 per cent. yield from commercial civet, and was able to regenerate the pure ketone by the decomposition of the recrystallised semicarbazone. Civetone was obtained in this way as a crystalline solid, m.p. $31^{\circ}C$.

Consideration of the refractive index of civetone suggested that it might be a cyclic ketone, and it was readily apparent that the substance was unsaturated, and contained one double bond. On hydrogenation with palladium and hydrogen it yielded a substance which did not differ from the original ketone in odour. It was proved analytically to be a dihydro compound of civetone, and later was shown to be the cyclic ketone with seventeen members in the ring. The true constitution of civetone was worked out by the following series of arguments. In the first place, when the oxide of civetone(38) is treated with reagents calculated to produce the Beckmann rearrangement, there



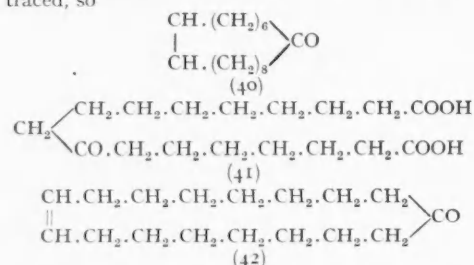
is produced an α -amino acid(39) with the same number of carbon atoms as the original compound. Again, the oxidation with chromic acid gives the dicarboxylic acid $(\text{CH}_2)_{15}(\text{COOH})_2$. This proves that the ring is a simple one.

When treated with Clemmensen's reagent (v.s.) it is reduced to the corresponding hydrocarbon, which on oxidation gives the same dicarboxylic acid:—



as that produced in the previous experiment, thus proving that the compound is symmetrical, and that the ethylene group is at the position immediately opposed to the carbonyl group. The true proof of the symmetrical nature of this ketone lies in the substances produced by strong oxidation. These consist of a mixture of pimelic, suberic and azelaic acids together with pentadecane-1:15-dicarboxylic acid. The three acids first mentioned have five, six and seven carbon atoms, and their formation shewn that chains of at least seven carbon atoms must extend from the ethylene group. The only other possibility is the compound(40) which would mean that some sebacic acid $(\text{CH}_2)_8(\text{COOH})_2$

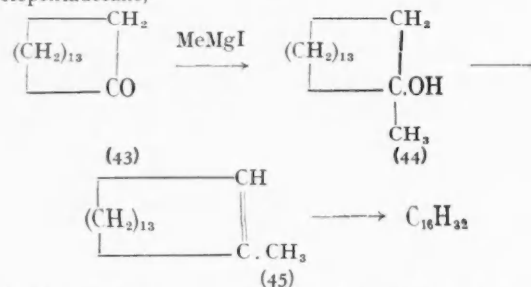
would be formed during the oxidation. No such acid has been traced, so



that we are forced to the conclusion that the correct formula for civetone, the active principle of civet, is Δ^7 cyclopentadecene-1-one(42). As additional evidence we may adduce the fact that on oxidation with permanganate it gives pentadecane-8-one-1:15-dicarboxylic acid(41), which has been synthesised by the passage of the vapour of azelaic ester over heated iron filings at $290^{\circ}C$.

Muscone

Walbaum(15), in 1906, discovered in natural musk, less than 1 per cent. of a ketone $C_{15}H_{28}O$, or $C_{16}H_{30}O$, with a very strong musk odour, which appeared to be the active odorous principle of the natural substance. The ketone was isolated by extracting the natural musk with ether, evaporating to dryness and steam distilling out the muscone, which was finally obtained as a liquid b.p. $145\text{--}147^{\circ}/4\text{ mm}$. Later investigation shewed that the actual formula was $C_{16}H_{30}O$ and that by Clemmensen's reagent, which has proved of great service in this investigation, it was possible to reduce muscone to a saturated hydrocarbon $C_{16}H_{32}$. The character of this substance suggested that it might be a methyl derivative of cyclopentadecane,

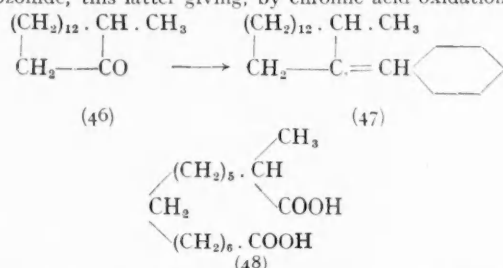


and this hydrocarbon was synthesised in the following way. The cyclic ketone containing fifteen carbon atoms in the ring (43) was treated with the Grignard reagent from methyl iodide and the secondary alcohol (44) produced. This, on dehydration, yielded the methyl derivative of cyclopentadecene (45), and the reduction of this by catalytic hydrogenation gave a hydrocarbon identical with that obtained by the Clemmensen reduction of muscone.

Thus, the formula of muscone is definitely established as a methyl derivative of cyclopentadecanone. The relative positions of the methyl and carbonyl group remained to be settled. There are seven possibilities, the CH_3 and CO groups being in the possible positions 1:1, 1:2, 1:3, 1:4, 1:5, 1:6, 1:7. The position 1:1 is immediately ruled out as being incompatible with the general properties; while the 1:5, 1:6 and 1:7 positions are ruled out on account of the fact that a 1:10 dicarboxylic acid is formed by the oxidation of muscone. This leaves the decision between the 1:2, 1:3 and 1:4 positions. In order to test this, Ruzicka prepared the semicarbazones of inactive 1:2, 1:3 and 1:4 methyl-pentadecanones and compared their melting points with that of the semicarbazone of natural muscone. The 1:3 com-

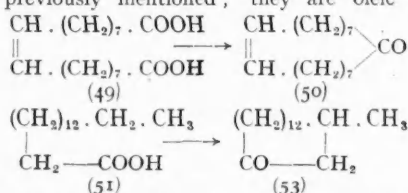
pound depressed the m.p. of the semi-carbazone of the natural product and was therefore ruled out; the synthetic 1:2 and 1:4 semicarbazones did not depress the melting point and the decision between the 1:2 and 1:4 formulae must be made on other grounds.

When muscone is converted into its benzyldene derivative (47) by the action of benzaldehyde, this may be converted into an ozonide, this latter giving, by chromic acid oxidation the



compound 2-methyl tridecane-1:13-dicarboxylic acid (48), a substance whose constitution could be checked by synthesis. The formula for natural muscone is, therefore given by (46) and, chemically speaking, it is 1-3-methyl cyclopentadecanone.

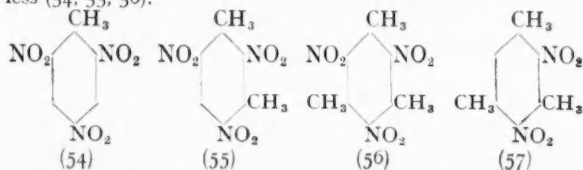
The origin of civetone and muscone in the animal system has given rise to some speculation. The only really common substances that occur in the animal system, which have an uninterrupted chain of methylene groups are the higher fatty acids which are associated with glycerol in the form of the fats. Inspection of these fatty acids reveals two which could very easily act as raw material for the formation of the two cyclic ketones previously mentioned; they are oleic acid (49)



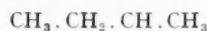
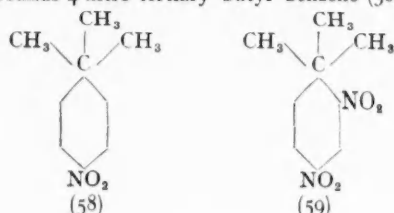
which should correspond to civetone (50) and palmitic acid (51) which is very similar in structure to muscone.

Synthetic Musk Substitutes

The high price, commercial variations, and comparative scarcity of natural musk, taken together with the ignorance concerning its true nature, led chemists to seek a synthetic substitute for musk. Among the realms of organic chemistry certain of the nitrocompounds have a musk-like odour. This is not apparent with the simple nitro derivatives of benzene, since even trinitrobenzene is odourless, but appears in certain cases when the aromatic ring is substituted by alkyl groups. Thus, it has been stated by Noelting that sym-trinitrotoluene, sym-trinitrometaxylene, and sym-trinitromesitylene are odourless (54, 55, 56).



When working with large quantities of dinitromesitylene (57) it is noticed that this compound has a pronounced musk-like odour, although, of course, not sufficiently intense to serve as a perfumery substance. Again, Malherbe (16) during his research on the nitration of tertiary butyl benzene produced the two compounds 4-nitro tertiary butyl benzene (58), a yellow



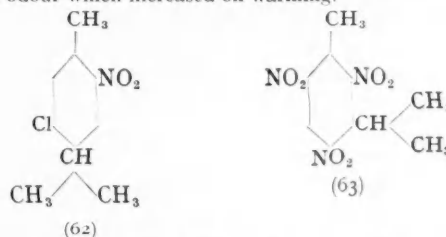
(60)



(61)

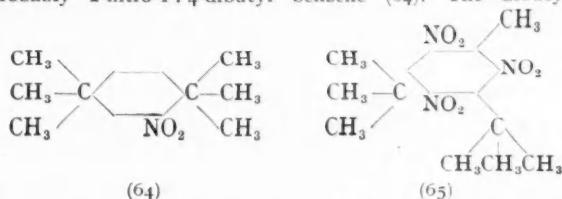
liquid boiling at 142°/17 mm. and 2:4-dinitrotertiary butyl benzene (59), yellow prisms m.p. 61-92° C. Both these compounds were devoid of the true musk odour, as also was the 4-nitro-secondary butylbenzene (60) prepared by Glatfield and Werthiem (17), and the 3- and 4-nitronormal butyl benzenes (61) prepared by Reilly and Hickinbottom (18).

The first traceable report of an aromatic compound with a musk odour is contained in a remark of Kopp (19), who says that Margraf published, in the Transactions of the Berlin Academy for 1759 a statement to the effect that oil of amber forms with nitric acid, a compound which can be used as artificial musk. This observation was, apparently, lost, for we find Elsner (20) in 1842 rediscovering this fact. Later, in 1856, Vohl (21) distilled from lignite tar an oil which gave on nitration an odorous body resembling both bitter almonds and musk. The first definite isolated compound of the musk series was prepared by Vongerichten (22) in 1878 who pointed out that the chloro and bromonitroparacymenes (62) had an odour slightly resembling musk. Finally, Kolbe (23) described trinitro meta cymene (63) as a crystalline solid with a feeble musk odour which increased on warming.



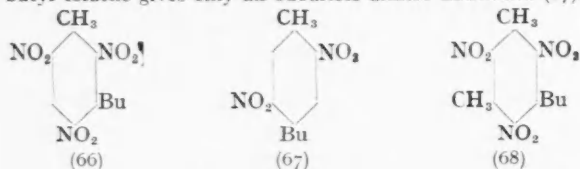
In order to facilitate the discussion of the compounds which have been more recently investigated in this series, it is proposed to divide them up according to the various hydrocarbons from which they are prepared. The first of these is butyl toluene.

When tertiary butyl chloride is condensed with toluene in the presence of aluminium chloride a mixture of isomers is formed of which the metabutyl toluene is predominant, the para being the main constituent of the remaining fraction. If ferric chloride is used as the condensing agent an excess of the para derivative is obtained. It is difficult to separate these two isomers without chemical treatment since the meta compound has a b.p. 188-188.5° C., and the para isomer b.p. 189-190° C. When the reaction is conducted on a large scale other compounds are produced in recognisable quantities. Thus Baur isolated butylbenzene, dibutyl benzene, dibutyl toluene, and butyl-m-xylene in addition to the compounds mentioned as the main products. The presence of benzene and xylene derivatives does not arise from the presence of benzene and xylene as impurities in the toluene used in this process, but from a singular decomposition which takes place when toluene is heated alone with aluminium chloride; under these circumstances benzene and m-xylene are formed, together with a little ethylbenzene. It may be mentioned here that dibutylbenzene gives a dinitro compound, m.p. 167-168° C., which has a very feeble musk odour, attributed by Baur (24) to a trace of impurity. The substance referred to is probably 2-nitro-1:4-dibutyl benzene (64). The dibutyl



toluene gave a trinitro compound (65) which had no musk odour.

There are four mono-nitro derivatives of 3-*ter*-butyltoluene. Direct nitration in acetic acid gives the "6" derivative, which by reduction to the amino group, acetylation, nitration and removal of the acetyl group, gives the 5-nitro derivative. Baur hoped to get a tetranitro derivative of butyl toluene by the trinitration of this 5-nitro derivative, but complete destruction of the nucleus ensued. Stronger nitration gives the 2:4 or 2:6 dinitro compound as an oil without pronounced musk odour and is the original musk substitute of Baur (66). (To avoid printing difficulties the butyl (tertiary) group will be written "Bu"). It may be added here, that para-tertiary butyl toluene gives only an odourless dinitro derivative (67).



The manufacture of the trinitrobutyl toluene of Baur was patented. In brief, his method was to heat toluene with butyl halides in the presence of aluminium chloride and to collect the fraction in the product which boiled at 170–200° C. This fraction was nitrated to give the musk product. Later Baur (26) was able to show that the fraction which boiled at 170–200° C., consisted mainly of *m*-tertiary butyl toluene, with a little of the para derivative and a trace of the corresponding butyl-*m*-xylene. The musk substitute consisted of the odorous trinitro derivatives of the *m*-butyl toluene and *m*-butylxylene (68), together with the odourless dinitro derivative of *p*-butyltoluene (67). Capeller (32) has prepared 3-normal butyl toluene, by the interaction of *m*-xylyl bromide and *n*-propyl bromide in the presence of sodium. It gives an inodorless trinitro derivative, m.p. 78–5° C.

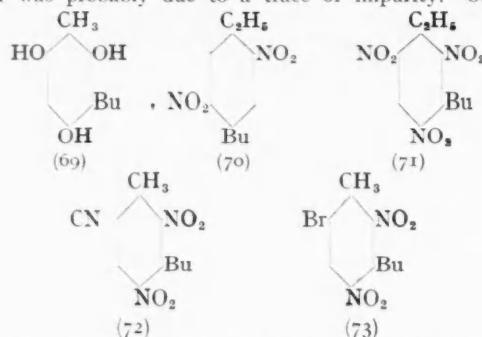
At the present time Baur's original musk is little used, other and more pleasant products having taken its place. It was, however, used at one time considerably and, mixed with nine times its weight of acetanilide or other inert substance, is an article of commerce. Its place in perfumery has been taken by the corresponding compound from *m*-xylene (68), in which there is an additional methyl group, while the musk ambrette is analogous, but has a methoxy group in place of the methyl group just referred to.

A very curious source of musk Baur, which has been proposed as a method for the preparation of a commercial musk substitute, (25) is the oil obtained by the oxidation of petroleum sludge. When that fraction of crude petroleum which boils above 300° C. is sprayed with air and steam through a heated tube containing asbestos covered with copper oxide, several complex organic acids and aldehydes are formed together with an oil b.p. 140–300° C. This on nitration gives a certain amount of trinitrobutyltoluene. The process has not been exploited commercially. Among the various researches which have been carried out on the odour problems relating to this particular synthetic musk we may mention the experiments of Grijns, (27) who endeavoured to ascertain whether any relation existed between the odour of such substances and their capacity for the absorption of radiant heat, a suggestion which was first put forward by Faraday. He found that no such relation was observable. Herzig and Wenzel, (28) on the other hand, experimented on the possibility of converting the musk Baur into the corresponding phlorogulcinol derivative, (69) but were unsuccessful.

Structural Variations and Musk Odour

The experiments of Baur, Bischler (29) and Noelting (30) on the variation of the musk odour of derivatives of the butylbenzene series have resulted in the preparation of many interesting compounds, an account of which is given below; their results may be summarised in the following statement:—That the —CO.CH₃, —CN, —CHO and —N₃(azido) groups do not destroy the musk odour, but that the —CO.C₆H₅, —SO₂.C₆H₅(toluenesulphonyl), —CH=NOH, and —CH=CH.NO₂, —COO.C₆H₅ and —SO₃H groups destroy the odour. Although no more definite correlation could be established than this, it is more or less in keeping with the general trend of relations between the chemical nature and odorous qualities of perfumery substances.

Baur prepared an ethyl derivative of his musk, the ethyl group replacing the methyl group. He found that when ethylbenzene and tertiary butyl chloride were heated together in the presence of anhydrous ferric chloride, para-butylethylbenzene was formed, which on nitration gave a dinitro derivative m.p. 140° C., in which the very faint musk odour was probably due to a trace of impurity. On the



other hand, heating the two reacting materials with aluminium chloride gave the metabutylethylbenzene, which gave a trinitro derivative (71) possessed of an intense musk odour.

The work of Bischler was mainly concerned with the replacement of one of the nitro groups in the synthetic musks by the cyano or halogen groups. Thus when the "6" nitro group of musk Baur is replaced by CN the musk odour is still present (72) (Bischler's "cyano-musk"). On the other hand the replacement of the nitro group by bromine, or the sulphonyl group (—SO₃H) leads to odourless compounds (73).

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(To be continued)

Over-Production of Carbon Black

CARBON black production in the United States increased to a new high level in 1930, when the total output amounted to 379,942,000 pounds, an increase over 1929 of 13,500,000 pounds, or 3.7 per cent. This increase, coming after a gain in output in 1929 of 47 per cent., resulted in an over-supply, with consequent fall in prices, as the total sales to domestic and foreign buyers in 1930 amounted to 251,539,000 pounds, 11 per cent. less than in the previous year.

According to the report of the U.S. Bureau of Mines, from which these statistics are taken, the year witnessed a further gain in the standing of Texas as a carbon-black producer and a corresponding loss in the importance of Louisiana. Production in Texas in 1930 amounted to 271,749,000 pounds, or 72 per cent. of the total. The chief reason for the decline of production in Louisiana is the competition offered by long natural gas lines, such as those from Monroe-Richland to St. Louis, New Orleans, and Atlanta. With carbon black selling in some cases at 3 cents per pound and the yield at less than a pound and a half per thousand cubic feet of gas, a profit is not possible unless the gas can be purchased under 2 cents. Gas at this low price, however, is only available in a few localities, like the Panhandle, where the supply greatly exceeds the demand of industrial and domestic users.

Phosphate Fertiliser Conditions in Germany

A Review of Post War Statistics

A COMPARISON of the phosphate fertiliser conditions in Germany in 1913 and 1929, and the decline of the German superphosphate industry, is dealt with in statistical detail in a recent article which appeared in the News Edition of our American contemporary, *Industrial and Chemical Engineering*. This article, which is by Dr. W. A. Dyes, of Berlin, indicated that wrong assumptions concerning the amount of phosphate fertiliser in the German soil had a very detrimental effect on agricultural production in Germany between 1920 and 1926.

Two-thirds of the German agricultural lands need phosphate fertilisers to guarantee good results and satisfactory harvests. The consumption of raw phosphates for the period 1920 to 1926, however, only reached a total of 2,200,000 tons, whereas prior to 1913 it averaged more than 1,000,000 tons annually. Improved harvests again date from the time when imports increased anew to about 900,000 tons per annum during the period 1927 to 1929. In 1928-29 the ratio of fertilisers consumed was only 1.2 parts of phosphoric acid to 1 part of nitrogen as compared with 3 parts in 1913, whilst the proportional consumption of potash was 2.6 parts to 1 part of nitrogen in 1913, and only 1.8 parts in 1928-29.

Imports from France

Production and consumption of superphosphates in France shows an enormous extension since 1929. Germany, however, consumes at present about 2,200,000 tons of basic slags annually, and half of this large quantity is imported from France and other countries. The imports in 1913 amounted to only 53,000 tons, but increased from 517,000 tons in 1924 to more than 1,100,000 tons in 1928 and 1929. In the latter year 51 million marks were spent abroad for such purchases. The same quantity of phosphoric acid, also bought abroad, would have cost only about 16 million marks, which upon being treated chemically within the country would supply agriculture with superphosphates and other new phosphate fertilisers. In such a way 35 million marks would be saved to the country by reducing the surplus of imports. It is an indication of the poverty of Germany that France exports her basic slags to Germany and has been able to increase, not only her production of superphosphates from 1,920,000 tons in 1913 to about 2,400,000 tons in 1929, but also her consumption of raw phosphates from 1,100,000 tons in 1913 to 1,740,000 tons in 1929.

In consequence of these conditions the German superphosphate industry had great difficulty in retaining even 45 per cent. of the superphosphate sales commanded in 1913. France controls in Tunis, Algeria, and Morocco a yearly output of more than 5,000,000 tons of phosphates, which are of great assistance to its superphosphate industry. Germany's imports of phosphates in 1929 amounted to about 275,000 tons from North African possessions and to 140,000 tons from Florida. The large requirements of German agriculture can be satisfied only by importation.

Wider Employment of Raw Phosphate

More surprising, however, are the following official statistics which show Germany's development in new phosphate fertilisers (Rhenania phosphate) and electrically-produced phosphoric acid, as well as the increasing manufacture of mixed fertilisers. The total imports of raw phosphate in 1913 (1,025,000 tons) were claimed by the German superphosphate industry as raw material for their own works; whilst for the period 1919 to 1924 the quantities of raw phosphates consumed by the superphosphate industry nearly equalled the total phosphate imports. The following figures show the extent to which differences increased year by year and clearly prove the enormous extension in the employment of raw phosphate for purposes other than for superphosphate.

Year	Total Imports of Raw Phosphate Tons	Raw Phosphate Consumed in Superphosphate Industry Tons	Raw Phosphate for Purposes Other than Superphosphate Tons
1925	467,000	347,000	120,000
1926	415,000	269,000	146,000
1927	910,000	409,400	500,600
1928	813,000	321,000	492,000
1929	929,000	434,000	495,000

About 500,000 tons of raw phosphates are now taken annually by producers outside of the superphosphate industry. Developments in the treatment of phosphates in the electric furnaces of the I.G. Farbenindustrie, A.-G., in Piesteritz, the production of Rhenania phosphate by the Rhenania-Kunheim Verein chemischer Fabriken, and the manufacture of mixed fertilisers by other concerns, together with the increased employment of phosphate salts for various purposes, are the causes of this great change. It is not surprising, therefore, that of the 131 superphosphate works in Germany in 1913, only 30 or 40 per cent. are now running. On the other hand, the Dutch superphosphate industry is operating at a capacity of 100 per cent. and exports about 400,000 tons to Germany, Great Britain, and other countries, and nearly 20 per cent. of the German superphosphate consumption is taken from imported product.

Rhenania Phosphate

Rhenania phosphate produced by the Kali-Chemie, A.-G., in Berlin, contains from 23 to 31 per cent. of soluble phosphoric acid and 40 per cent. of lime. Careful tests have proved that its fertilising effect is 21 to 25 per cent. superior to that of basic slags. This special phosphate is made by treating raw phosphate with soda at high temperatures. The works are equipped for a large turnover, but corresponding large sales are prevented by the competition with foreign superphosphate.

All reports which relate to the German fertilizer industry complain of the comparatively cheap producing costs abroad, and of the burdens in Germany, which in most cases prevent a reasonable profit. There is also considerable complaint about the importation of foreign basic slags, to the extent of more than 1,000,000 tons per annum without duty. The cheap prices of Dutch superphosphate, with high rebates to the trade and to the agricultural co-operating societies, are frequently mentioned as a reason why the manufacture of German phosphate fertilisers is not more profitable. Belgium and Poland can also produce more cheaply, as they make sulphuric acid by roasting zinc ores, whereas in Germany the acid is made from imported pyrites, which is more expensive.

The above figures on the increased consumption of raw phosphates outside of the superphosphate industry do not specify the employment of this raw material in the Piesteritz works of the I.G. Farbenindustrie. The report of this chemical trust does not permit exact conclusions as to the increasing production of these works.

Mixed I.G. fertilisers average 18 per cent. of nitrogen and about 16 per cent. of phosphoric acid. The German nitrogen syndicate controls nearly all the sales of nitrogen fertilisers, including mixed fertilisers. The following statistics contain some mixed products from manufacturers other than the I.G. Farbenindustrie:—

Year	Nitrogen Consumed in Mixed Fertilisers Tons	Total Nitrogen Consumption Tons
1924-25	14,212	334,000
1925-26	9,870	325,000
1926-27	16,448	392,983
1927-28	18,824	378,200
1928-29	28,998	409,871

This means a consumption of about 165,000 tons of mixed fertilisers and of about 25,000 tons of phosphoric acid in such mixed fertilisers. On the basis of about 70 per cent. of phosphoric acid per ton of raw phosphate, only about 40,000 tons of this raw material would be employed at present for the German consumption of I.G. and similar mixed fertilisers. Consequently, nearly 450,000 tons of raw phosphates would be consumed either for mixed nitrogen fertilisers serving the export trade or for other purposes.

United States Antipyrine Imports

ANTIPYRINE imported for consumption into the United States in the first quarter of 1931 amounted to 15,000 lb., as compared with receipts of 19,800 lb. during the entire year of 1930. In 1930 Germany supplied 11,403 lb., the remainder coming from France; during the first quarter of 1931 Germany supplied the entire amount imported.

Oil and Colour Chemists' Association

Annual General Meeting

THE annual general meeting of the Oil and Colour Chemists' Association was held at the Institute of Chemistry, 30, Russell Square, London, on Thursday, May 14, with the president (Mr. Noel Heaton) in the chair.

The Council's report for the year May, 1930, to May, 1931, was adopted without discussion. This report again shows a satisfactory increase in membership, the total number now being 424. The membership of the Manchester Section is now 94, an increase of four over the preceding year, and in the report a tribute is paid to the progress of the Manchester Section under the able chairmanship of Mr. G. A. Campbell. Thanks are also expressed to Mr. Forrest Scott, who has taken over the hon. secretaryship of the Association in London, in succession to Mr. R. P. L. Britton; to Mr. M. W. Dougherty, the hon. treasurer; and to Dr. J. E. Cutter, the hon. auditor.

The following were elected as officers of the Association for the coming session: Mr. Noel Heaton (president); Mr. S. A. Bone and Sir Charles Mander, Bart. (vice-presidents); F. Fancutt, T. Drummond Kerr, K. Mackenzie-Richards, F. Sowerbutts and Dr. L. A. Jordan (members of council).

A vote of thanks was passed to the retiring members of council, and the honorary officers were re-elected as follows: Mr. Forrest Scott (hon. secretary); Mr. M. E. Dougherty (hon. treasurer); Dr. J. E. Cutter (hon. auditor).

Properties of Synthetic Resins

The paper presented by Mr. W. D. Owen and Mr. A. M. Thomas was a review of available knowledge on the subject of synthetic resins as applied to electrical insulating purposes, the subject being treated broadly from electrical, chemical and mechanical points of view. On the chemical side, it was mentioned that the chemical structure of bakelite manufactured from an acid catalyst differs considerably from that of a bakelite manufactured from an alkaline catalyst, and that the field of use for synthetic resins, other than the formaldehyde products, is rather limited in the electrical industry. The authors also said that the desirable features of synthetic resins from the point of view of electrical insulation are well within the control of the chemist, but a greater degree of collaboration between chemists and electrical engineers was desirable.

In the course of the discussion which followed, the chairman (Mr. J. A. F. Wilkinson) said the members of the Association were more interested in the oil soluble synthetic resins from the ordinary paint and varnish point of view, and he did not know how far these were important from the electrical point of view. That point had not been made clear by the authors. It would be interesting to know how far they compared with the older varnishes which had been used for such purposes. For instance, in connection with the impregnation of coils with insulating varnishes, as a member of the B.E.S.A. Committee which drew up the standard specification for insulating varnishes, he was surprised to find that many of these varnishes did not apparently get far into the coils during impregnation; they seemed to sit on the outside, and he would like to know how that position had altered since the development of the new synthetic resins.

Mr. S. M. T. Bell, commenting on the fact that the chemical structure of a bakelite manufactured from an acid catalyst varies considerably from that of a bakelite manufactured from an alkaline catalyst, said that when bakelite or phenol formaldehydes are formed with an acid constitution, a very small proportion only of the catalyst is required for maximum reactivity and the acid did not appear in the final product except as an impurity. It appeared, therefore, that in the case of an acid resin the acid was what might be called the true catalyst. In the case of an alkaline resin, the final product was very different; the alkali was used in much larger proportions and appeared as part of the final product.

Mr. S. Whitehead urged the need for making synthetic resin products which are not only sound mechanically, but which are also easily machinable. He said that greater uniformity in the product was also desirable.

Mr. H. C. Silver said that more attention should be paid to the purity of the materials used, as the two great drawbacks of synthetic resin products were moisture and impurities.

Dr. L. A. Jordan said that no mention had been made by the authors of coumarone, nor of the newer furfural product.

He also asked the authors to say something on the subject of natural products, for there were certain people who were trying to sell the natural gums and shellacs, but were finding it difficult owing to competition from the synthetic products. Was it not possible to give them some encouragement for lac as an insulating material, or should these people be put out of their misery and be told that the thing is dead?

Mr. Owen, as one of the joint authors of the paper, said that they would give a detailed reply to the discussion in writing. He had very little evidence that coumarone was being used except as a plasticising agent, and he could not recall any case in which furfural had been used. As to the position of those endeavouring to sell shellac, he suggested they still had a large field in the gramophone industry, and as long as the synthetic resin industry could not capture that market, the shellac people would have it to themselves.

Irish Free State Patents

To the Editor of THE CHEMICAL AGE.

SIR,—We think it is generally well known that Letters Patent of inventions and registrations of trade marks and designs granted in the United Kingdom now only extend to the United Kingdom of Great Britain and Northern Ireland and the Isle of Man, and that separate protection is required in the case of the Irish Free State. Notwithstanding this, however, we are given to understand from a reliable source that there are many traders who are using the word "Patented" or the word "Registered" in connection with articles which they are sending into the Irish Free State, without such articles having been actually patented or registered in the Irish Free State, while other traders are also using the word "Registered" in conjunction with trade marks used on goods being sent into the Irish Free State, without such trade marks having been duly registered there. We think it as well, therefore, to draw the particular attention of traders to the fact that under Section 150 (2) of the Irish Act (Industrial and Commercial Property (Protection) Act) it is an offence punishable with fine to represent as patented an article which is not patented in the Irish Free State. Accordingly, manufacturers who continue to use the word "Patent" or "Patented" on articles sold or exposed for sale in the Irish Free State, and which are not actually patented in that country, run the risk of conviction; and we understand, in fact, that the Irish Free State Controller of Patents is actually contemplating commencing proceedings in many such cases almost immediately. The same remarks apply to trade marks.—Yours, etc.,

GEE AND CO., Patent Agents.

51-52, Chancery Lane, W.C.2.

May 18, 1931.

New Irish State Chemist Appointed

DR. THOMAS NOLAN, Dublin, has been appointed successor to the late Professor Hugh Ryan as State Chemist to the Irish Free State. Dr. Nolan was educated in Dublin and graduated in 1909 from the Royal University; two years later he won a travelling studentship and pursued post-graduate researches in London, Geneva, Berlin and Marburg Universities. In 1915 he joined the research staff of Nobel Industries, Ltd., and within five years he rose to the position of chemist in charge of manufacturing developments. During his industrial career Dr. Nolan took out patents in connection with improvements in the lacquer, artificial leather, and explosive industries. In 1925 he resigned his industrial work and returned to Dublin as assistant to the late State Chemist.

Possible Chemical Tariff in France

ACCORDING to the United States Assistant Trade Commissioner in Paris, the Union des Industries Chimiques has requested the French Minister of Commerce to consider the possibility of customs protection for the French chemical industry. The Union des Industries Chimiques is an association of producers with a combined capital of 15 billion francs, and an annual turnover of about 10 billion francs. Its board of directors is composed of the representatives of such important companies as Rhone Poulenc, Saint Gobain, Kuhlmann and Centrale de Dynamite.

The Institute of Chemistry

Result of the April Examinations

THE following is the pass list in the April examinations of the Institute of Chemistry:—

EXAMINATION IN CHEMISTRY FOR THE ASSOCIATESHIP:

Bagg, Douglas Gordon, Birkbeck College, London; Berry, Wallace, Royal Technical College, Glasgow; Brown, James, Royal Technical College, Glasgow; Buckley, Robert, B.Sc. (Lond.), Central Technical School, Liverpool; Cramer, Harris, B.Sc. (Lond.), Technical College, Cardiff; Edwards, Gerald Harry, University College, Leicester; Glass, Norman, Central Technical School, Liverpool; Gordon, Joseph, Rutherford Technical College, Newcastle-upon-Tyne; Leslie, Robert Edward, Heriot-Watt College, Edinburgh; Minifie, Bernard Whitley Elliott, The University, and Merchant Venturers' Technical College, Bristol; Morton, Frank, B.Sc. (Lond.), Wigan and District Mining and Technical College, and Technical College, Birmingham; Prescott, George Frederic, Wigan and District Mining and Technical College; Sleep, William Henry, B.Sc. (Lond.), Central Technical School, Liverpool; Stephens, Robert Charles Farquhar, Trained under G. Rudd Thompson, F.I.C.; Stroud, Hubert Henry, West Ham Municipal College, and Birkbeck College, London; Templeton, William Hugh, B.Sc. (Lond.), Chelsea Polytechnic, London; Vizofsky, Abraham, Chelsea Polytechnic, London; Webb, William Denis Lucking, East Ham Technical College, and West Ham Municipal College.

EXAMINATION FOR THE FELLOWSHIP.

In Branch A: Inorganic Chemistry. Gaskin, John George Noel, B.Sc. (Lond.), and Reeve, Walter William, B.Sc. (Lond.).

In Branch C: Organic Chemistry, with reference to Oils, Fats, etc. Elwes, Eric Vincent, and Mackinney, Herbert William.

In Branch D: Biochemistry, with special reference to Industrial Microbiology. Clayton, Donald Herbert Frank, B.Sc. (Lond.), A.R.C.S., D.I.C.

In Branch E: The Chemistry, including Microscopy, of Food and Drugs, and of Water. Brindle, Harry, B.Sc. (Lond.), Martin, Nicholas Henry, B.Sc. (Dun.), McGregor, Percy, B.Sc. (Lond.), Paterson, Colin, B.Sc. (Lond.).

In Branch F: Agricultural Chemistry. Greenstreet, Victor Robert, A.C.G.F.C.

In Branch G: Industrial Chemistry, with special reference to Oils, Fats, etc. Joseph, Douglas Eric, B.Sc. (Lond.).

In the Chemistry of Textiles, etc. Blakeley, John Dyson, B.Sc. (Lond.), and Payne, Reginald William, B.Sc. (Lond.).

In Foods, with special reference to Chocolate and Confectionery. Avent, Alfred George.

Death of Mr. Thomas Colyer

WE regret to learn that Mr. Thomas Colyer (chairman of Carty and Son, Ltd., back and vat makers, London), died on May 6, aged 73, after an illness which had kept him away from business for some 16 months. He had over 50 years of strenuous business life, and probably few are still in business who were his contemporaries when he was a director of Shutters, Chippendale and Colyers Ltd., of Stratford (originally of Leman Street) and secretary of the Master Coopers' Association. In 1908 he brought the vatmaking branch of Shutters over to Carty and Son, then at Bermondsey. In 1921 the firm moved to its present address at Peckham; Mr. H. T. Carty retired, and Carty's became a company, with Mr. T. Colyer chairman and managing director, in which capacity he served up to the date of his death. The present directors of Carty and Son, Ltd., are Mr. Robert S. Johnson (now chairman), and Mr. Wilfrid T. Colyer, the late Mr. T. Colyer's son.

Motor Fuel Proprietary

PRESIDING at the annual meeting of the Motor Fuel Co. Proprietary, Ltd., which was held on Wednesday last, May 20, at Caxton Hall, Westminster, Mr. Lawrence Seligman said it was now possible to assure a certain and substantial profit on every ton of coal carbonised. With regard to the company's process, it was as near the ideal as present knowledge of this industry would permit. The company was in negotiation with different parties for the erection of the plants on a large scale at pitheads. The main question at the present moment was one of finance, and they were hopeful that this would be forthcoming. The report was adopted. ■■■■

Chemical Matters in Parliament

Extracting Oil from Coal

SPEAKING in the House of Lords on Wednesday last, May 21, Lord Rutherford, who is chairman of the Advisory Council of the Department of Scientific and Industrial Research, said that the experiments of the Fuel Research Board have definitely established the fact that "it is scientifically possible to provide the bulk of our oil by the treatment of our coal." Setting aside the question of cost, he said it is in the national interest that this form of research should be vigorously prosecuted. At any moment the information gained might prove to be of the greatest importance to the nation in making a decision on economic or on general political grounds.

Describing the process of low temperature carbonisation, Lord Rutherford mentioned development of a new fireclay retort which offers great promise in the manufacture of petrol, Diesel oil and road tar from coal, in addition to smokeless fuel. He also gave the House a remarkably hopeful report regarding the hydrogenation process applied to coal. Lord Parmoor subsequently reminded the House that the Government had recently devoted £40,000 to this research work.

Government Laboratory Staff

In the House of Commons on Wednesday, May 13, Mr. Bromley (Barrow-in-Furness) asked the Minister of Health whether, as the whole of the revenue obtained from dutiable articles is controlled by the Government laboratory, and in view of its work on matters of public health, he will reconsider the present policy of reducing the already small qualified staff, 80 in number, by 30 per cent. and substituting untrained boys of approximately 19 years of age?

In reply, Mr. Pethick-Lawrence (Financial Secretary to the Treasury) said that in accordance with the recommendations of the Carpenter Committee, it is proposed that the grade of temporary assistant chemist in the Government laboratory should be abolished, and that the work at present entrusted to chemists Class II and this grade should be gradually reallocated between a new grade of chemists and a new grade of assistants to be recruited between the ages of 17 and 20 from candidates who have reached an educational standard equivalent to the Intermediate Science Degree examination, or have gained the National Certificate in chemistry issued by the Institute of Chemistry in conjunction with the Board of Education.

Hydrocarbon Oils Duty

In the House of Commons on Tuesday, May 19, Mr. Remer asked the Chancellor of the Exchequer the quantities imported into this country in 1930 of oils taxed upon importation which are used for industrial purposes, as distinct from motor spirit?

In reply, Mr. Pethick-Lawrence said the quantity of hydrocarbon oils, classified under headings other than "motor spirit," which was duty paid for home consumption in 1930 was 25½ million gallons, and practically the whole of this was no doubt used for industrial purposes. In addition, a considerable quantity of hydrocarbon oils, classified as "motor spirit," is used for industrial purposes. Precise statistics are not available but it is estimated that the total amount of dutiable hydrocarbon oils used for other than road purposes in 1930 was approximately 62 million gallons.

Scottish Dyers' Dispute

THE terms of settlement in the wages dispute between the Amalgamated Society of Bleachers and Dyers and the Scottish Employers' Federation of Bleachers and Dyers (piece goods section) were ratified on Monday last, May 18, at a conference of the two bodies held in the Central Station Hotel, Glasgow. Under the agreement the wages of male employees are to be reduced by 5d. per week in the case of youths of 14 and up to 18. 8d. for men of 21 years and over, while the pay of women workers is to be reduced by 4d. in the case of girls of 14 and up to 1s. for women of 21 years and over. In addition, a further reduction is to take effect under the sliding wage scale, amounting to 1s. 6d. per week for males of 21 years and over and 10d. per week for females, with corresponding reductions for younger workers.

Dead Sea Potash

First Report of Operations in Palestine

PROGRESS which has been made in the extraction of potash, bromine and other salts from the waters of the Dead Sea are detailed in a report which was submitted to the shareholders of Palestine Potash, Ltd., on the occasion of their first annual general meeting held on April 21.

According to this report the chemical facts of this extraction scheme were established by experiments carried out on a small scale on the shores of the Dead Sea for a number of years since 1921. These experiments proved that the effect of the natural rapid evaporation of the Dead Sea water, which represents a concentrated solution of five different salts (*i.e.*, common salt, potassium chloride, magnesium chloride, calcium chloride and magnesium bromide), is always to precipitate these salts in the same strictly defined order, namely, common salt, then crude potassium salts (carnallite), and, finally, the magnesium salts, while the greater parts of the bromide contents of the water remains in the final liquor.

The plant involved in the production of potash and other products by this method includes: (1) large, open, shallow pans, erected on the land bordering the sea, in which the water from the sea is rapidly evaporated through exposure to the influence of hot sun rays and winds; (2) pumps for pumping the water from the sea into the various pans; (3) plant for collecting or harvesting the precipitated salts and transporting them to the refinery; (4) pumps and pipe lines for fresh water supply from the Jordan for the needs of the refinery, cooling the engines and general purposes of the undertaking; (5) potash factory or refinery for working up the crude potash salts into the final product for marketing; (6) bromine plant for extracting the bromine concentrated in the final brine and preparing it for marketing; and (7) power station.

Progress during First Working Season

The main part of the orders for machinery and apparatus was placed in England in January, 1930, immediately following the execution of the Concession Agreement by the Governments of Palestine and Trans-Jordan on January 1, 1930, while the excavation work and construction of the evaporating pans and the erection of houses were simultaneously begun at the Dead Sea. On April 1 the operation of pumping the water from the Dead Sea into the pans started, with the completion of the pumping station and installation of one large pump, these operations being considerably increased two months later by the installation of two more pumps. With the arrival of engines, pipes and other machinery at the Dead Sea, the erection of other plant, *i.e.*, fresh water supply, power house and workshops, was taken in hand, and the greater part completed by the end of July. By that time a pan area of about 120 acres was filled with rapidly evaporating sea water and the precipitation of large quantities of common salt forming layers of a few inches thick in the pans was already in progress.

Soon after the greater part of the common salt had separated out, the precipitation of crude potash salt (carnallite) began, and by the end of August a few thousand tons formed loose layers in the lower evaporating pans designated for this purpose. The collection and harvesting of this salt into piles was in progress at the beginning of October and proceeded up to the end of December. A certain amount of common salt of good quality was also collected into piles. The operations of the first working season were thus completed, having fully confirmed the results obtained by the experimental work of the preceding years, and proved the possibility of manufacturing the potash from the waters of the Dead Sea by applying the sun's rays as heat for evaporating and precipitating the chemical salts.

Marketing Prospects

In view of the satisfactory results of the first year's operations (when both quality and quantity of the crude potash salts produced, as well as the cost of production, fulfilled expectations) the Board decided to increase the plant, to create a unit capable of producing up to the limits of the existing means of transportation from the Dead Sea to one of the Palestine seaports, Jaffa or Haifa. The refinery will be ready in the course of 1931, in time for treating the crude salts produced in 1930 and 1931, so that by the end of the latter

year potash, as well as bromine, and some common salt, may be on sale on the markets.

Should the coming season's operations of the increased plant prove as satisfactory as those of the previous one under review, the question of a further increase of production and the construction of new means of communication with the Mediterranean port, Haifa, will have to be considered. It is believed that a narrow gauge railway from the Dead Sea to Beisan, the junction of the existing railway, Haifa-Damascus, will best serve this purpose, and a reconnaissance survey of the line has already been prepared by the company's engineers.

Drug and Fine Chemical Wages

Notice to Terminate Existing Agreement

DISCUSSING the situation in relation to wages and conditions in the drug and fine chemical industry, *The Chemical Worker* (the Union organ) for May states:—

"The stage is almost set for what may go down in history as the drug trade's biggest struggle. The Employers' Federation have given the Union the requisite notice to terminate the existing national wages and conditions agreement for the purpose of securing their desires in the matter of reduced wages and charges. The Union has accepted the notice—it had no alternative, but it has not stood still waiting events. It has called upon its members concerned to formulate 'new terms of wages and conditions' to be submitted to national employers for adoption. All this has proceeded with speed and enthusiasm, and the interest shown by branches concerned in the formulation of new terms indicates a desire to face the coming situation in a business-like manner. It is one thing to propose terms—but after that must come their realisation.

"The Drug and Fine Chemical Manufacturers' Association terminated the agreement to secure 'reduced wages' in the next agreement. What reductions they want is not yet known—but we remember their last move in this direction which included 'cuts' as high as 16s. per week. Most of our members who are sensible see clearly a definite division of objectives between the employers and ourselves. They desire worsened conditions—we want some desirable improvements on existing conditions. Either party is within its rights in desiring change—either party is equally right in contesting those changes. What is going to be the result of the opposing applications? In the last analysis the result is entirely in the hands of our members. If they want these new conditions, as indications seem to show, and they insist on those terms and no others as the conditions under which they will give their labour, the new agreement will contain the terms the branches have just formulated.

"A deadlock can and may arise through the employers refusing to discuss any new agreement except one that gives them the reductions they set out for. It is at this point when the issue goes finally and definitely out of the hands of Union officials and becomes something the mass rank and file must take control of. If this issue resolves itself into a test of strength through a clash of two definite opposites, not just a mere difference of opinion, nothing but 100 per cent. solidarity of the members concerned can secure the adoption of the new terms. Our members have to work under the new terms, ours or the employers', not the negotiating officials, and our members will choose—they will, in fact, determine the issue."

Ruths Steam Storage

AN agreement for the acquisition, by Ruths Steam Storage, of the whole of the share capital of Ruthsaccumulator A.B., the Swedish company which owns the whole of the Ruths rights for the rest of the world outside the English company's territory, has been completed. The consideration is to be satisfied by the issue of 409,729 "A" ordinary shares of 10s. each, credited as fully paid. The directors of Ruths Steam Storage state that this merger will have the practical effect of eliminating the royalties payable to the Swedish company of 4 to 5 per cent. of the gross turnover of the English company's business. It will also result in the cancellation of the special rights attaching to "B" shares, which at present carry 10 per cent. of any amount distributed by way of dividend and more than 50 per cent. of the voting power.

From Week to Week

AN address on synthetic resins was delivered to the Plymouth Rotary Club by Dr. F. A. Royle, of the Plymouth Technical College, at their recent meeting on Friday, May 15.

COURSES of study in chemical engineering are being arranged by the Widnes Education Committee. It is understood that this scheme has received the support of Imperial Chemical Industries, Ltd.

THE British Commercial Secretary at Warsaw reports that imports of organic chemical materials and products into Poland during February last totalled 7,453,000 zloty (about £172,100); exports totalled 1,074,000 zloty (about £24,800).

THE value of carbon dioxide for fire fighting was the subject of a paper delivered by Mr. John Kerr McMyn, chairman of John Kerr and Co. (Manchester), Ltd., to the annual conference of the Professional Fire Brigade Association, at Scarborough, on Thursday, May 14.

THERE was a serious explosion of chemicals at 18a, Queen's Road, Bayswater, London, on Friday, May 15th, at premises occupied by C. O. Brullhardt, boiler fluid manufacturers. The concussion caused damage to many neighbouring windows.

THE International Conference of Leather Trades' Chemists is to be held at Basle, September 13-18, at the invitation of the Swiss Leather Trades' Chemists Society. Those desirous of presenting a paper must communicate the title to Dr. A. Gansser, Grellingerstrasse 77, Basle, Switzerland.

THE Secretary of State for Scotland has appointed Dr. Birkett Wylam to be chief inspector for Scotland under the Alkali, etc., Works Regulation Act, in place of Mr. J. W. Young, who is retiring. Since 1923 Dr. Wylam has been engaged as research chemist and latterly as process manager at one of the works of Scottish Dyes, Ltd.

A GENERAL MEETING of the members of the Chemical Industry Club, London, is to be held on Monday evening, June 8, to consider various proposed amendments of the existing rules. These include a proposal that the name should be changed to "The Chemical Club," the committee considering this preferable to the New York title "The Chemists' Club."

IT IS ESTIMATED that an additional 100,000 bags of maize will be used by the distilleries in Southern Rhodesia if the recommendation of the Parliamentary Select Committee encouraging the manufacture of power alcohol are adopted. This committee is also advocating legislation to provide for the inclusion of 20 per cent. of alcohol (99.8 per cent. purity) in petrol used as motor spirit.

THE agreement lately reached between the Iraq Government and the Iraq Petroleum Co. was ratified on Tuesday last, May 19. Under the agreement, one pipe-line will be laid through British mandated territory to Haifa, and a second line will go through French mandated territory. The exact area in which the Iraq Petroleum Company shall operate is defined, the area west of the Tigris being left available for exploitation by other concessionaires.

SIR WILLIAM J. POPE, professor of chemistry at Cambridge University, gave the first of a series of six weekly broadcast talks on "Chemistry and Industry," in connection with the jubilee of the Society of Chemical Industry, on Wednesday last, May 20. Referring to the possibility of helium production on a large scale in the Dominions, he said that the search for British helium was not yet ended, and they might look forward with some confidence to the large scale production of helium in our own Dominions.

THE Manchester Municipal College of Technology have issued a prospectus of their summer evening classes which begin on Monday, June 1, and continue until Tuesday, July 21. Classes in the department of chemistry and chemical technology include:—Introduction to Chemical Literature, Chemical Testing of Cellulose, Practical Inorganic Chemistry, Some Applications of X-Rays in Modern Chemistry, The Measurement of Hydrogen Ion Concentration and its Technical Applications, Technical Gas Analysis, Iceing and Cake Decoration, Practical Cereal Chemistry; those in the department of textile chemistry are:—The Manufacture of Wood Pulp, The Micelle Theory, New Dyestuffs and Textile Assistants, Recent Developments in Calico Printing.

THE Indian Government announces the appointment of Mr. S. N. Gupta as trade commissioner at Hamburg. Mr. Gupta was formerly deputy trade commissioner at London.

MANLOVE, ALLIOTT AND CO., LTD., Blooms Grove Works, Nottingham, announce that their offices and works will be closed from Saturday, May 23, until Wednesday morning, May 27, in consequence of the Whitsuntide holidays.

AN export duty of 50 pesos per kilo on iodine is announced from Chile, with exemptions for the Cosach concern and its subsidiary companies. Independent companies are delivering their entire production to the Cosach Co., who only pay 6 pesos per kilo.

THE benzol-producing interests of Britain, France and Germany are to meet in conference in Hamburg early next month to discuss the adoption of a new international standard for the refined spirit. The conference is being held at the instance of the Continental producers.

AN Italian royal decree was recently issued and published in the Official Gazette formally announcing the constitution of the General Bergamot Warehouse at Reggio Calabria, in connection with the regulations and measures taken by the government to promote exports of essential oil of bergamot. The initial capital involved is 2,000,000 lire.

A FELLOWSHIP in chemistry, tenable for two years at the Massachusetts Institute of Technology, has been awarded to Mr. J. R. Myles, B.Sc., of University College, Dundee (University of St. Andrews). This fellowship is one of the Commonwealth Fund Fellowships which are offered by the Commonwealth Fund of New York to British graduates in American Universities.

ON Friday, May 16, a party of distinguished French engineers and industrialists, under the leadership of M. de Fleuriau, the French Ambassador, visited a number of works in the Birmingham area. Among the works visited were the Kynoch Works at Witton, Allen Everitt and Sons, Ltd., at Smethwick, and Elliott's Metal Works at Selly Oak, all of which are subsidiaries of Imperial Chemical Industries, Ltd.

A NEW monthly periodical of interest to the paint, varnish, lacquer, enamel and colour industries has made its appearance under the title of *Paint Manufacture*. The publishers, Leonard Hill, Ltd., of 231, Strand, London, W.C.2, are to be congratulated upon the appearance of the first number, in which we notice a useful article on the parts played by solvents and diluents in nitro-cellulose film formation. Among other contributions there is one on the uses of silicon ester preparations for stone preservation.

THE old-established Greensplat China Clay Works, together with the Trenance kiln and sett, belonging to the Western Counties Clay Co., Ltd., now in voluntary liquidation, was, with the plant and machinery, offered for sale by auction at St. Austell on Friday, May 15. There was only one bid, and at £1,000 Mr. R. J. Varcoe, china clay merchant, St. Austell, became the purchaser. It is understood that Mr. Varcoe intends to exploit a new patent of his own whereby he claims china clay can be produced at one-third of the present cost.

RICH deposits of potash are reported to have been discovered in the districts of Kashka-Daria, Surkhan-Daria and Karaliuk in Uzbekistan (Russian Central Asia). The top layer of the Karaliuk deposit has a thickness of one-and-a-half metres and contains 32 per cent. of potassium chloride, which is equal to 19 per cent. of potassium oxide, in comparison with 11.3 per cent. present in the potash region of Solikamsk (Urals). When these deposits are worked it is probable that the potash will be distributed among the cotton plantations in Russian Central Asia, the Soviet estates and collective farms.

UNIVERSITY NEWS.—LONDON: Major Church, M.P., is one of the new members of the Senate elected by Convocation. Dr. C. H. Lander has been appointed to the Chair of Engineering, and the title of Emeritus Professor of Biochemistry has been conferred on Dr. Arthur Harden on his retirement from the Lister Institute of Preventive Medicine.—LEEDS: At the centenary celebrations of the Leeds School of Medicine on July 1, the honorary degree of D.Sc. will be conferred on Sir F. Gowland Hopkins, Professor of Biochemistry at Cambridge.—MANCHESTER: On Founders Day the recipients of honorary degrees included Dr. Harden (Doctor of Laws), a graduate of Owens College and a member for eleven years of the teaching staff of its chemistry department.

Patent Literature

The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at 1s. each.

Abstracts of Accepted Specifications

- 342,761. SULPHO FATTY ACIDS. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, November 6, 1928.

Halogenated higher fatty acids which may contain double bonds and/or hydroxy groups, are sulphonated by heating with a sulphite solution with or without pressure and/or a catalyst, whereby the halogen is partly or wholly replaced by sulphonic groups and polymerization of the fatty acid molecule may occur and also replacement of the halogen by hydroxy groups. Examples are given of the sulphonation of hexachlor-stearic acid, a mixture of chlorinated linoleic acids, hexachloro-ricinoleic acid, and a product obtained by chlorinating a solution of ricinoleic acid in carbon tetrachloride. The products are protective colloids.

- 342,771. ACETYLENE, ETHYLENE AND ACETALDEHYDE. J. Ferguson, Norton Hall, The Green, Norton-on-Tees, and Imperial Chemical Industries, Ltd., Millbank, London. Application date, November 8, 1929.

Hydrocarbon gases or vapours, excluding methane, are heated with a large excess of steam above $1,000^{\circ}\text{C}$., for not more than two seconds. Thus, oil gas containing hydrogen 20 per cent., methane and ethane 36 per cent., and ethylene and propylene 44 per cent. is mixed with 10 volumes of steam and passed rapidly through an unpacked silica tube heated to $1,250^{\circ}\text{C}$., the gases being then rapidly cooled. The acetylene in the products may be recovered by washing with solvents or the products may be used in the manufacture of acetaldehyde.

- 342,775. ZINC CHLORIDE. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, November 9, 1928.

Zinc chloride lyes employed in the manufacture of vulcanized fibres are treated with zinc sulphate, whereby any calcium chloride is converted into calcium sulphate and may be removed.

- 342,807. DYES. A. Carpmal, London. From I. G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date November 19, 1929.

The tetrazo compound of $p:p'$ -diamino-diphenylmethane, $p:p'$ -diamino-triphenylmethane, $p:p'$ -diamino-diphenyl-dimethylmethane or their derivatives substituted in the aryl residues are combined with two molecular proportions of combining components, one at least being 2:8-dihydroxynaphthalene-6-sulphonic acid or a monoaryl-sulphonic acid ester of this acid. The dyestuff may further be esterified with an aryl-sulphochloride when the acid is used. Several examples are given. Reference has been directed by the Comptroller to specifications 206,831 and 244,782.

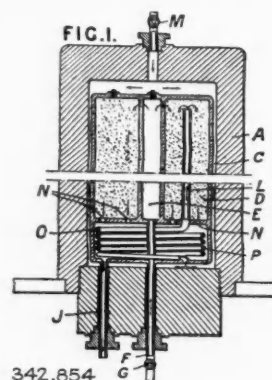
- 342,834. PURIFYING OILS AND WAXES. Compagnie Provencale de Raffinage de Corps Gras Mineraux, 119, Rue Félix Pyat, Marseilles, France. International Convention date, July 27, 1929.

Mineral and tar oils and waxes are dissolved in decahydronaphthalene and treated at $25-30^{\circ}\text{C}$. with 98 per cent. sulphuric acid. After settling, the solution is neutralized by alkaline lye decolorized by fuller's earth, and the solvent distilled off.

- 342,854. CATALYTIC EXOTHERMIC GAS REACTIONS. J. L. Brill, Norton Hall, Norton-on-Tees. International Convention date, December 31, 1928.

Catalytic reactions which are carried out under pressure and at temperatures of $450^{\circ}-500^{\circ}\text{C}$., are initiated by the heat derived from an auxiliary catalytic exothermic reaction with the same gases carried out under such conditions that the heat evolved is available for transfer to the gases or the apparatus in the main reaction. The gases are passed through pipe F to the priming catalyst E and then through the main catalyst D to the openings N and outlet J. When the

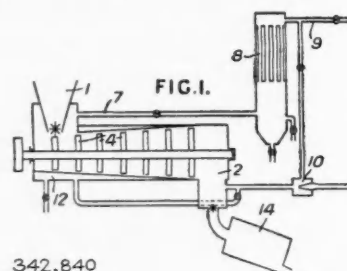
catalyst D is heated, the valve G is closed and valve M opened, so that the main gas supply passes through annular space C, through heat exchanger P and through pipe L to the catalyst D. The products are cooled in passing over the heat exchanger P to the outlet J. In the production of the higher homologues of methanol from carbon monoxide and hydrogen at pressures above 200 atmospheres and tem-



peratures of $450^{\circ}-500^{\circ}\text{C}$., the priming catalyst may be a mixture of precipitated oxides of copper, manganese and magnesium, which initiates the reaction at 250°C . In the production of ammonia from a nitrogen-hydrogen mixture obtained from water gas, the amount of carbon monoxide purification may be reduced and the gases passed over a low-temperature methane-forming catalyst to initiate the ammonia synthesis.

- 342,840. DISTILLING OILY RESIDUES. K. Gordon, H. Harper, and W. I. Jones, Norton Hall, The Green, Norton-on-Tees, and Imperial Chemical Industries, Ltd., Millbank, London. Application date, December 18, 1929.

Oil residues of destructive hydrogenation are supplied through a hopper 1 to a retort 2, through which they are passed by agitators 4 against a current of hot flue gas or



steam. The vaporised oil and gas pass by pipe 7 to a condenser 8, where the oil is recovered, and the gas may be discharged through pipe 9 or re-circulated with more hot gas from the injector 10. The dry residue is discharged to a drum 14.

- 342,931. MICROCOSMIC SALT, POTASSIUM CHLORIDE, AMMONIUM CHLORIDE, FERTILISERS. Soc. d'Etudes Scientifiques et d'Entreprises Industrielles, Ougrée, Belgium. Assignees of E. Voituren, 264, Rue Ernest Solvay, Sclessin, Ougrée, Belgium. International Convention date, March 9, 1929.

A solution of sodium and potassium chlorides obtained from sylvinites is treated with phosphoric acid and ammonia in such proportions as to precipitate microcosmic salt on cooling.

Ammonium chloride and potassium chloride are obtained from the liquor, and may be fractionally precipitated. The products are used as fertilizers, and an example is given.

343,006. DYES. Soc. of Chemical Industry in Basle, Switzerland. International Convention date, November 2, 1928.

A diazotized aromatic sulphonic acid ester of a non-sulphonated *o*-aminophenol is coupled with a non-sulphonated amino- or oxy-compound of the benzene series or with a *N*-*o*-methylsulphonate of a non-sulphonated aromatic amine of the benzene series. The dyestuff obtained is saponified and then alkylated or acylated, and may be treated with agents yielding metals. In an example, the dyestuff *p*-toluene sulphonic acid ester of 2-aminophenol \rightarrow *m*-toluidine, *p*-xylydine, *p*-cresidine or the sodium-*o*-methanesulphonates of aniline, *o*-toluidine, and *o*-anisidine is saponified and then acylated with acetyl chloride. Other examples are given, and also particulars of the use of the dyestuffs for colouring lacquers, etc.

343,013. MERCAPTOBENZOTHAZOLES. Goodyear Tire and Rubber Co., 1144, East Market Street, Akron, Ohio, U.S.A. Assignees of J. Teppema, 29, Mayfield Apartment, Twin Oaks, Akron, Ohio, and L. B. Sebrell, R.D.I., Cuyahoga Falls, Ohio, U.S.A. International Convention date, November 26, 1928.

These compounds are obtained by treating the sodium, potassium or ammonium salt of *o*-aminothiophenol or a nuclear derivative with an acid such as hydrochloric or sulphuric, in the presence of carbon bisulphide.

343,014-6. DYES. Soc. of Chemical Industry in Basle, Switzerland. International Convention date, October 5 and October 8, 1928.

343,014. Azo dyes containing no sulphonic or carboxylic groups, which are derived from *o*-oxydiaz compounds and aromatic amine or oxy compound coupling components are treated with one or more hydroxides of mordanting metals in the presence of alkali but in absence of salts of hydrosulphuric acid. In an example, the dyestuff 2:1-aminonaphthol \rightarrow 3-naphthol is heated with a solution containing chromium hydroxide and excess of caustic potash. The product is insoluble in water, but dissolves in Zapon varnish to a blue-violet solution. A large number of other examples are given.

343,016. Azo dyes are obtained by coupling a 1-naphthol-4-carboxylic acid ester with a diazo compound, and are used as acid, mordant, lake and cotton dyestuffs, or for cellulose derivatives. Some examples are given.

343,054. HYDROGEN-NITROGEN MIXTURES. H. Ritter, 71, Hohenzollernstrasse, Essen, Germany. International Convention date, November 9, 1928.

Hydrocarbons and steam are heated to 850° C. with a nickel catalyst, and the mixture so obtained is further heated with air to 950°-1,200° C. in the presence of a nickel catalyst. Oxides of carbon are removed, and a hydrogen-nitrogen mixture is obtained.

343,072. STIBINIC ACIDS. I.G. Farbenindustrie Akt.-Ges., Frankfurt-on-Main, Germany. International Convention date, November 7, 1928.

Benzimidazolone-stibinic acids are obtained by treating *o*-diaminobenzene-stibinic acids with phosgene, or diazotized amino-benzimidazolones with antimonious acid. Examples are given.

343,090-1. ANTHRAQUINONE DERIVATIVES. A. Carpmæl, London. From I.G. Farbenindustrie Akt.-Ges., Frankfurt-on-Main, Germany. Application date, November 13, 1929.

Quinizarin is treated with piperidine or its homologues or derivatives to obtain 1:4:1':4'-tetrahydroxy-2:2'-dianthraquinonyl, which may then be treated with boiling nitronaphthalene to obtain 1:4:4'-trihydroxy-2:2'-dianthraquinonyl-3:1'-oxide.

343,100. DYES. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfurt-on-Main, Germany. Application date, August 9, 1929.

1:1'-Dianthraquinonyl-2:2'-dialdehyde or an ω : ω '-tetrahalogen-2:2'-dimethyl-1:1'-dianthraquinonyl is treated with an acid condensing agent in the presence of a reducing agent, and the Bz-mono- or Bz-Bz'-dihydroxy-pyranthrones obtained

are alkylated to obtain vat dyes. The products may be halogenated. Examples are given.

343,108. PURIFYING CARBON BLACK. J. P. Baxter, Norton Hall, The Green, Norton-on-Tees, and Imperial Chemical Industries, Ltd., Millbank, London. Application date October 10, 1929.

Carbon black is purified from volatile impurities by maintaining it in dispersion in air or other gas at 150° C. to 900° C. according to the gas employed.

343,116. HYDROCARBONS. I.G. Farbenindustrie Akt.-Ges., Frankfurt-on-Main, Germany. International Convention date, October 16, 1928.

Butadiene and its homologues are heated to 400° C. or higher, with or without a catalyst. Vinyl-cyclohexenes and other oily polymerization products are obtained. Examples are given.

343,164. DYES. I.G. Farbenindustrie Akt.-Ges., Frankfurt-on-Main, Germany. International Convention date, November 16, 1928.

A diazo compound of an aromatic amine, diamine, or amino-azo compound or of a heterocyclic amine or of a derivative containing no group inducing solubility in water, is coupled in substance or on the fibre, with an arylide of carbazole-2-hydroxy-3-carboxylic acid. Examples are given.

343,172. HYDROGEN. Union Chimique Belge, Soc. Anon., 61, Avenue Louise, Brussels. International Convention date, June 22, 1929.

A mixture of methane and water vapour is decomposed by heat, which is supplied by the combustion of gases in the reaction chamber during one period, the air for combustion being preheated but not the combustible gases. The preheated reaction gases are passed in the opposite direction through the heated reaction chamber during the next period. Two modifications of the apparatus are described.

343,178. THIOCYANATES. E. Hene, 26, Hubertus-Allee, Grunewald, Berlin. International Convention date, November 19, 1928.

Sulphides, hydrosulphides, polysulphides, or thiocarbonates are heated with non-metallic compounds containing one or more carbon-nitrogen linkages such as dicyanamide or thiourea to obtain thiocyanates.

Specifications Accepted with Date of Application

347,592. Sulphonating higher fatty acids and their derivatives. Naamlooze Vennootschap Chemische Fabriek Servo, and M. D. Rozenbroek. January 22, 1929.

347,593. Ketones, Production of. Holzverkohlungs-Industrie Akt.-Ges. January 29, 1929.

347,601. Cooling of coke, and obtaining a nitrogen-hydrogen mixture. B. Tyrer, and Imperial Chemical Industries, Ltd. January 28, 1930.

347,620. Unsaturated hydrocarbons, Manufacture of. J. Y. Johnson. (I.G. Farbenindustrie Akt.-Ges.) January 17, 1930.

347,666. Halogen phthalic anhydrides, Production of. P. F. Bangham, J. Thomas and Scottish Dyes, Ltd. December 24, 1929.

347,641. Fixation of ammonia-nitrogen. N. Caro and A. R. Frank. January 30, 1929.

347,680. Separating gold and antimony contained in sulphide of antimony ores. H. W. C. Annable and Ferro Alloy Co. of Africa (Proprietary), Ltd. January 27, 1930.

347,681. Vat-dyestuffs, Manufacture of. Soc. of Chemical Industry in Basle. January 25, 1929.

347,722. Halogen anthraquinone-3:2 (N)-benzacidones, Manufacture of. J. Y. Johnson. (I.G. Farbenindustrie Akt.-Ges.) October 31, 1929.

347,727. Conversion of hydrocarbons into those of lower boiling point. J. Y. Johnson. (I.G. Farbenindustrie Akt.-Ges.) January 2, 1930.

347,729. Phospho-nitro-potassium fertilizer, Manufacture of. Soc. l'Air Liquide, Soc. Anon. pour l'Etude et l'Exploitation des Procédés G. Claude. January 3, 1929.

347,695. Acetone from acetylene, Production of. Holzverkohlungs-Industrie Akt.-Ges. January 24, 1929.

347,742. Disazo-dyestuffs, Manufacture of. Soc. of Chemical Industry in Basle. February 2, 1929.

347,743. Oxidation of organic substances. J. Y. Johnson. (I.G. Farbenindustrie Akt.-Ges.) January 31, 1930.

347,763. Calcium carbide, Manufacture of. E. M. S. Industrial Processes, Ltd., and A. T. De Moulipied. February 4, 1930.

347,774. Monoacyl diamines of the benzene series, Process for. A. Carpmæl. (I.G. Farbenindustrie Akt.-Ges.) February 7, 1930.

- 347,799. Zinc sulphide, Preparation of. W. W. Triggs. (*St. Joseph Lead Co.*) February 24, 1930.
- 347,802. Polymerization products of diolefines, Manufacture of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) February 28, 1930.
- 347,849. Pure zinc oxide and zinc carbonate, Manufacture of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) April 5, 1930.
- 347,887. Condensation products containing halogen, Manufacture of. W. W. Groves. (*I.G. Farbenindustrie Akt.-Ges.*) May 3, 1930.
- 347,892. Aromatic condensation products, Manufacture of. W. W. Groves. (*I.G. Farbenindustrie Akt.-Ges.*) May 7, 1930.
- 347,916. Oxidizable organic compounds. Goodyear Tire and Rubber Co. July 27, 1929.
- 347,931. Ketones from secondary alcohols, Production of. Rheinische Kampfer-Fabrik Ges. June 14, 1929.
- 347,933. Ketones from secondary alcohols, Production of. Rheinische Kampfer-Fabrik Ges., and H. Sandkuhl. June 4, 1930. Addition to 347,931.
- 347,935. Potassium nitrate and soda. Chemieverfahren Ges. July 13, 1929.
- 347,937. Phosphorous and phosphorus-oxygen compounds from raw phosphates. Metallges. Akt.-Ges. June 11, 1929.
- 347,943 and 348,001. Alkoxy-aldehydes, Manufacture of. Dr. A. Wacker Ges. für Elektro-Chemische Industrie Ges. July 20, and November 25, 1929.
- 347,955. Rubber, Treatment of. Naugatuck Chemical Co. July 2, 1929.
- 347,974. Fertilizers, Manufacture of. Imperial Chemical Industries, Ltd. July 26, 1929.
- 347,989. Cyanogen halides, Manufacture of. Imperial Chemical Industries, Ltd. August 16, 1929.
- 348,000. Sulphuric acid, Manufacture of. Imperial Chemical Industries, Ltd., September 13, 1929.

Applications for Patents

[In the case of applications for patents under the International Convention, the priority date (that is, the original application date abroad which the applicant desires shall be accorded to the patent) is given in brackets, with the name of the country of origin. Specifications of such applications are open to inspection at the Patent Office on the anniversary of the date given in brackets, whether or not they have been accepted.]

- Berry, H. H., Courtaulds, Ltd., and Glover, W. H. Manufacture, etc., of chemical compounds. 14,533. May 16.
- Bolgar Oil Processes, Ltd., Mackay, P. A., and Ormandy, W. R. Recovery of sulphur from products obtained in treatment of mineral oils, etc. 14,402. May 15.
- Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. Manufacture of calcium boride. 14,077. May 12.
- Manufacture of vat dyestuffs. 14,160. May 13.
- Manufacture of conversion products of higher paraffin hydrocarbons containing sulphur. 14,309. May 14. (August 19, 1930.)
- Manufacture of vulcanisation accelerators. 14,469. May 15.
- Manufacture of conversion products of higher paraffin hydrocarbons containing sulphur. 14,490. May 15. (August 9, 1930.)
- Carter, P. G., Imperial Chemical Industries, Ltd., and Thomson, R. F. Production of halogenated dyes, etc. 14,138. May 13.
- Collins, J. J. Electrodeposition of metals for plating. 14,067. May 12.
- Distillers Co., Ltd., Gilmour, R., and Sangwell, H. Concentration of dilute acetic acid, etc. 14,023. May 12.
- Dunbar, A. C. Dyeing processes. 14,394. May 15.
- Fuhr, C. Methods of removing scale from boilers, etc. 14,444. May 15.
- Gas Light and Coke Co., and Griffith, R. H. Use and reactivation of active carbon. 13,966. May 12.
- Groves, W. W., and I.G. Farbenindustrie Akt.-Ges. Cold asphalt, and application thereof. 14,416. May 15.
- Harrison, J. H. W. Manufacture of carbohydrates compounds. 14,376. May 15.
- Hills, H. G. Electrolytic production of white lead. 14,322. May 14.
- Horsley, G. F., and Imperial Chemical Industries, Ltd. Production of alcohols from olefines. 14,540. May 16.
- Hurtley, W. R. H., Imperial Chemical Industries, Ltd., and Madel, W. R. Production of aromatic hydrocarbons from phenols. 14,191. May 13.
- I.G. Farbenindustrie Akt.-Ges., and Johnson, J. Y. Separation of impurities from fatty oils. 13,885. May 11.
- I.G. Farbenindustrie Akt.-Ges. Manufacture of vat dyestuffs. 13,912. May 11. (Feb. 13, 1930.) (Germany, Feb. 13, 1929.)
- Manufacture of disulphides from mercapto compounds. 13,913. May 11. (Germany, May 9, 1930.)

- Manufacture of 3-hydroxythionaphthene-7-carboxylic acid chlorides, etc. 13,914. May 11. (Germany, May 10, 1930.)
- Packing for photographic plates. 14,044. May 12. (Germany, May 12, 1930.)
- Manufacture of azo dyestuffs. 14,312. May 14. (Germany, May 14, 1930.)
- Manufacture of carbyl sulphate, ethionic acid, etc. 14,417. May 15. (Germany, May 16, 1930.)
- Manufacture of halogen-containing vat dyestuffs. 14,425. May 15. (Jan. 25, 1930.) (Germany, April 27, 1929.)
- Imperial Chemical Industries, Ltd., Ward, D., Baldwin, A. W., and Hailwood, A. J. Detergent, emulsifying, and wetting agents. 13,930, 13,931. May 11.
- Recovery of sulphur dioxide from gases. 14,026. May 12.
- and Paterson, T. R. Manufacture of pentaerythritol tetranitrate. 14,189. May 13.
- Manufacture of cellulose ethers. 14,190. May 13.
- Stabilisation of explosives. 14,192. May 13.
- and Wheeler, T. S. Production of chlorinated derivatives of toluene. 14,541. May 16.
- Baldwin, A. W., and Hailwood, A. J. Manufacture of wetting, etc., agents. 14,542. May 16.
- Lonza Elektrizitätswerke und Chemische Fabriken Akt.-Ges. Manufacture of nitric acid of high concentration. 14,164. May 13. (Germany, May 13, 1930.)
- Mentzel, A. Manufacture of highly-active alkali coke briquettes for production of alkali cyanides, etc. 14,337. May 14. (Germany, May 14, 1930.)
- Production of mixed fertilisers. 14,338. May 14. (Germany, May 14, 1930.)
- Rowley, C. D., and From, V. C. Electrodeposition of metals. 14,350. May 15.
- Schlenker, E. Separation of solid and liquid fatty acids. 14,313. May 14.
- Soc. Anon. L'Aspiration Scientifique. Centrifugal separators. 14,579. May 16. (Belgium, May 17, 1930.)
- Soc. of Chemical Industry in Basle. Manufacture of carboxylic acid amides containing basic substituents. 13,900. May 11. (Switzerland, May 9, 1930.)
- Manufacture of azo-dyestuffs. 14,045. May 12. (Switzerland, May 13, 1930.)

Chemical Trade Inquiries

These inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

ROMANIA.—The Commercial Secretary to H.M. Legation at Bucharest reports that the "Regie Autonome P.C.A." (Directia Serviciului Hidraulic), is calling for tenders, to be presented in Bucharest by June 3, for the supply of 4,500 kilogrammes zinc-white and 5,000 kilogrammes lead minium. (Ref. B.X. 7,069.)

CANADA.—A firm established at Toronto as manufacturers of automatic machinery and machinery agents are prepared to undertake the representation of British firms in ointment mills, drug mills, paste mixers, powder mixers, powder sifters, automatic weighing machines, centrifugal pumps, homogenisers. (Ref. No. 429.)

Tariff Changes

IRISH FREE STATE.—Changes in the Irish Free State Customs Tariff, resulting from the Budget Resolutions which were introduced by the Minister of Finance on May 6, include a reference to imported hydrocarbon light oils upon which a new customs duty of 4d. per gallon has been imposed. The expression "hydrocarbon light oils" includes hydrocarbon oils of which not less than 50 per cent. by volume distils at a temperature not exceeding 185° C., or of which not less than 95 per cent. by volume distils at a temperature not exceeding 240° C., or which give off an inflammable vapour at a temperature of less than 22.8° C. when tested in the manner prescribed by the Acts relating to petroleum. Provision has been made for the payment of drawback (equal to the amount of duty paid) on the exportation of any hydrocarbon light oils, or of any article in which there is contained any hydrocarbon light oil which was used as an ingredient in the manufacture or preparation thereof.

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at makers' works.

General Heavy Chemicals

ACID ACETIC, 40% TECH.—£18 15s. per ton d/d address U.K. in casks.
 ACID CHROMIC.—1s. per lb., less 2½% d/d U.K.
 ACID HYDROCHLORIC.—Spot, 3s. 9d. to 6s. carboy d/d, according to purity, strength and locality.
 ACID NITRIC, 80° Tw.—Spot, £20 to £25 per ton makers' works, according to district and quality.
 ACID SULPHURIC.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations; 140° Tw., Crude acid, 60s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.
 AMMONIA (ANHYDROUS).—Spot, 10d. per lb., d/d in cylinders.
 AMMONIUM BICHROMATE.—8½d. per lb. d/d U.K., or 8d. c.i.f. export.
 BISULPHITE OF LIME.—£7 10s. per ton, f.o.r. London, packages free.
 BLEACHING POWDER, 35/37%.—Spot, £7 19s. per ton d/d station in casks, special terms for contracts.
 BORAX, COMMERCIAL.—Crystals, £13 10s. per ton; granulated, £12 10s. per ton; powder, £14 per ton. (Packed in 1 cwt. bags, carriage paid any station in Great Britain. Prices quoted are for one ton lots and upwards.)
 CALCIUM CHLORIDE (SOLID), 70/75%.—Spot, £4 15s. to £5 5s. per ton d/d station in drums.
 CHROMIUM OXIDE.—9d. to 9½d. per lb. according to quantity d/d U.K.
 CHROMETAN.—Crystals, 3½d. per lb. Liquor, £18 12s. 6d. per ton d/d U.K.
 COPPER SULPHATE.—£25 to £25 10s. per ton.
 METHYLATED SPIRIT 61 O.P.—Industrial, 1s. 7d. to 1s. 11d. per gall.; pyridinised industrial, 1s. 9d. to 2s. 1d. per gall.; mineralised, 2s. 8d. to 2s. 11d. per gall. 64 O.P., 1d. extra in all cases. Prices according to quantity.
 NICKEL SULPHATE.—£38 per ton d/d.
 NICKEL AMMONIA SULPHATE.—£38 per ton d/d.
 POTASH CAUSTIC.—£30 to £33 per ton.
 POTASSIUM BICHROMATE CRYSTALS AND GRANULAR.—4½d. per lb. nett d/d U.K., discount according to quantity: ground ½d. per lb. extra.
 POTASSIUM CHLORATE.—3½d. per lb. ex-wharf, London, in cwt. kegs.
 POTASSIUM CHROMATE.—8½d. per lb. d/d U.K., or 8d. c.i.f. export.
 SALAMMONIAC.—First lump, spot, £40 17s. 6d. per ton d/d address in barrels. Chloride of ammonia, £37 to £45 per ton, carr. paid.
 SALT CAKE, UNGROUND.—Spot, £3 10s. per ton d/d station in bulk.
 SODA ASH, 58%.—Spot, £6 per ton, f.o.r. in bags, special terms for contracts.
 SODA CAUSTIC, SOLID, 76/77° E.—Spot, £14 10s. per ton, d/d station.
 SODA CRYSTALS.—Spot, £5 to £5 5s. per ton, d/d station or ex depot in 2-cwt. bags.
 SODIUM ACETATE 97/98%.—£21 per ton.
 SODIUM BICARBONATE, REFINED.—Spot, £10 10s. per ton d/d station in bags.
 SODIUM BICHROMATE CRYSTALS (CAKE AND POWDER)—3½d. per lb. nett d/d U.K., discount according to quantity. Anhydrous ½d. per lb. extra.
 SODIUM BISULPHITE POWDER, 60/62%.—£16 10s. per ton delivered 1-cwt. iron drums for home trade.
 SODIUM CHLORATE.—2½d. per lb.
 SODIUM CHROMATE.—3½d. per lb. d/d U.K., or 3½d. c.i.f. export.
 SODIUM NITRITE.—Spot, £19 per ton, d/d station in drums.
 SODIUM PHOSPHATE.—£14 per ton, f.o.r. London, casks free.
 SODIUM SILICATE, 140° Tw.—Spot, £8 5s. per ton, d/d station returnable drums.
 SODIUM SULPHATE (GLAUBER SALTS).—Spot, £4 2s. 6d. per ton, d/d.
 SODIUM SULPHIDE SOLID, 60/62%.—Spot, £10 5s. per ton, d/d in free drums. Crystals—Spot, £8 5s. per ton, d/d in free casks.
 SODIUM SULPHITE, PEA CRYSTALS.—Spot, £13 10s. per ton, d/d station in kegs. Commercial—Spot, £9 per ton, d/d station in bags.

Coal Tar Products

ACID CARBOLIC CRYSTALS.—5d. to 6½d. per lb. Crude 60's 1s. to 1s. 1d. per gall. August/December.
 ACID CRESYLIC 99/100.—1s. 9d. to 1s. 10d. per gall. B.P., 3s. 6d. per gall. 97/99.—Refined, 2s. 2d. to 2s. 3d. per gall. Pale, 98%, 1s. 8d. to 1s. 9d. Dark, 1s. 4d. to 1s. 4½d.
 ANTHRACENE OIL, STRAINED (GREEN OIL).—4½d. to 4½d. per gall.
 BENZOLE.—Prices at works: Crude, 7½d. to 8½d. per gall.; Standard Motor, 1s. 2d. to 1s. 3d. per gall. 90%.—1s. 3d. to 1s. 4d. per gall. Pure, 1s. 6d. to 1s. 7d. per gall.
 TOLUOLE.—90%, 1s. 9d. to 1s. 10d. per gall. Pure, 1s. 11d. to 2s. per gall.
 XYLOL.—1s. 8d. to 1s. 9d. per gall. Pure, 1s. 10d. to 1s. 11d. per gall. CREOSOTE.—Standard specification, for export, 5dd. to 5½d. net per gall. f.o.b.; for Home, 4d. per gall. d/d.
 NAPHTHA.—Solvent, 90/160, 1s. 3d. per gall. Solvent, 95/160, 1s. 4d. to 1s. 5d. per gall. Solvent, 90/190, 1s. to 1s. 2d. per gall.

NAPHTHALENE.—Purified Crystals, £11 11s. per ton.
 PITCH.—Medium soft, 45s. per ton, in bulk at makers' works.
 PYRIDINE.—90/140, 3s. 3d. to 3s. 6d. per gall. 90/160, 3s. 3d. to 3s. 6d. per gall. 90/180, 1s. 9d. to 2s. per gall.

Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated:—
 ACID AMIDONAPHTHOL DISULPHO (1-8-2-4).—10s. 9d. per lb.
 ACID ANTHRANILIC.—6s. per lb. 100%.
 ACID GAMMA.—Spot, 3s. 3d. per lb. 100% d/d buyer's works.
 ACID H.—Spot, 2s. 3d. per lb. 100% d/d buyer's works.
 ACID NAPHTHIONIC.—1s. 2d. per lb. 100% d/d buyer's works.
 ACID NEVILLE AND WINTHER.—Spot, 2s. 6d. per lb. 100% d/d buyer's works.
 ACID SULPHANILIC.—Spot, 8½d. per lb. 100% d/d buyer's works.
 ANILINE OIL.—Spot, 8d. per lb., drums extra, d/d buyer's works.
 ANILINE SALTS.—Spot, 8d. per lb. d/d buyer's works, casks free.
 BENZALDEHYDE.—Spot, 1s. 6d. per lb., packages extra, d/d buyer's works.
 BENZIDINE BASE.—Spot, 2s. 3d. per lb. 100% d/d buyer's works.
 BENZOIC ACID.—Spot, 1s. 8½d. per lb. d/d buyer's works.
 o-CRESOL 30/31° C.—£2 6s. 5d. per cwt., in 1-ton lots.
 m-CRESOL 98/100%.—2s. 9d. per lb., in ton lots.
 p-CRESOL 34½° C.—1s. 9d. per lb., in ton lots.
 DICHLORANILINE.—2s. 5d. per lb.
 DIMETHYLANILINE.—Spot, 1s. 6d. per lb., packages extra, d/d buyer's works.
 DINITROBENZENE.—7½d. per lb.
 DINITROCHLOROBENZENE.—£74 per ton d/d.
 DINITROTOLUENE.—48/50° C., 7d. per lb.; 66/68° C., 7½d. per lb.
 DIPHENYLAMINE.—Spot, 1s. 8d. per lb. d/d buyer's works.
 a-NAPHTHOL.—Spot, 1s. 9d. per lb. d/d buyer's works.
 B-NAPHTHOL.—Spot, £65 per ton in 1 ton lots, d/d buyer's works.
 a-NAPHTHYLAMINE.—Spot, 10½d. per lb. d/d buyer's works.
 B-NAPHTHYLAMINE.—Spot, 2s. 9d. per lb. d/d buyer's works.
 o-NITRANILINE.—5s. 11d. per lb.
 m-NITRANILINE.—Spot, 2s. 6d. per lb. d/d buyer's works.
 p-NITRANILINE.—Spot, 1s. 8d. per lb. d/d buyer's works.
 NITROBENZENE.—Spot, 6½d. per lb., 5-cwt. lots, drums extra, d/d buyer's works.
 NITRONAPHTHALENE.—8½d. per lb.
 R. SALT.—Spot, 2s. per lb. 100% d/d buyer's works.
 SODIUM NAPHTHIONATE.—Spot, 1s. 6d. per lb. 100% d/d buyer's works.
 o-TOLUIDINE.—Spot, 8d. per lb., drums extra, d/d buyer's works.
 p-TOLUIDINE.—Spot, 1s. 6d. per lb. d/d buyer's works.
 m-XYLIDINE ACETATE.—3s. 3d. per lb., 100%.

Wood Distillation Products

ACETATE OF LIME.—Brown, £7 5s. to £7 10s. per ton. Grey, £13 per ton. Liquor, 9d. per gall.
 ACETONE.—£63 to £65 per ton.
 CHARCOAL.—£6 to £8 10s. per ton, according to grade and locality.
 IRON LIQUOR.—24°/30° Tw., 10d. to 1s. 2d. per gall.
 RED LIQUOR.—16° Tw., 8½d. to 10d. per gall.
 WOOD CREOSOTE.—1s. 9d. per gall., unrefined.
 WOOD NAPHTHA, MISCIBLE.—2s. 9d. to 2s. 11s. per gall., according to quantity. Solvent, 3s. 9d. per gall.
 WOOD TAR.—£4 to £5 per ton.
 BROWN SUGAR OF LEAD.—£32 per ton.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 6d. to 1s. 1d. per lb. according to quality; Crimson, 1s. 3d. to 1s. 5d. per lb., according to quality.
 ARSENIC SULPHIDE, YELLOW.—1s. 7d. to 1s. 9d. per lb.
 BARYTES.—£6 to £7 10s. per ton, according to quality.
 CADMIUM SULPHIDE.—4s. 6d. to 5s. per lb.
 CARBON BISULPHIDE.—£26 to £28 per ton, according to quantity; drums extra.
 CARBON BLACK.—3d. to 4d. per lb., ex wharf.
 CARBON TETRACHLORIDE.—£40 to £50 per ton, according to quantity; drums extra.
 CHROMIUM OXIDE, GREEN.—1s. 2d. per lb.
 DIPHENYLGUANIDINE.—2s. 6d. per lb.
 INDIARUBBER SUBSTITUTES, WHITE.—4½d. to 5½d. per lb.; Dark, 4½d. to 4½d. per lb.
 LAMP BLACK.—£28 per ton, barrels free.
 LITHOPONE, 30%.—£19 to £21 per ton.
 SULPHUR.—£9 10s. to £13 per ton, according to quality.
 SULPHUR CHLORIDE.—4d. to 7d. per lb., carboys extra.
 SULPHUR PRECIP. B.P.—£55 to £60 per ton, according to quantity.
 VERMILION, PALE OR DEEP.—6s. 6d.—7s. per lb.
 ZINC SULPHIDE.—8d. to 11d. per lb.

Pharmaceutical and Photographic Chemicals

ACETANILIDE.—1s. 4½d. to 1s. 6d. per lb.
 ACID, ACETIC, PURE, 80%.—£37 5s. per ton d/d address U.K. in casks.
 ACID, ACETYL SALICYLIC.—2s. 7d. to 2s. 9d. per lb., according to quantity.
 ACID, BENZOIC B.P.—1s. 10d. per lb., for synthetic product. Solely ex Gum, 1s. 3d. to 1s. 6d. per oz.; 50-oz. lots, 1s. 3d. per oz.
 ACID, BORIC B.P.—Crystal, £31 per ton; powder, £32 per ton; For one-ton lots and upwards. Packed in 1-cwt. bags carriage paid any station in Great Britain.
 ACID, CAMPHORIC.—19s. to 21s. per lb.
 ACID, CITRIC.—1s. per lb., less 5%.
 ACID, GALLIC.—2s. 11d. per lb. for pure crystal, in cwt. lots.
 ACID, MOLYBDIC.—5s. 3d. per lb. in ½-cwt. lots. Packages extra. Special prices for quantities and contracts.
 ACID, PYROGALLIC, CRYSTALS.—7s. 3d. per lb. for 28-lb. lots.
 ACID, SALICYLIC, B.P. PULV.—1s. 5d. to 1s. 8d. per lb. Technical.—1s. to 1s. 2d. per lb.
 ACID, TANNIC B.P.—2s. 8d. to 2s. 10d. per lb.
 ACID, TARTARIC.—11½d. per lb., less 5%.
 AMIDOL.—7s. 6d. to 11s. 3d. per lb., according to quantity.
 AMMONIUM BENZOATE.—3s. 6d. per lb.
 AMMONIUM CARBONATE B.P.—£30 per ton. Powder, £39 per ton in 5-cwt. casks. Resublimated, 1s. per lb.
 AMMONIUM MOLYBDATE.—4s. 9d. per lb. in ½-cwt. lots. Packages extra. Special prices for quantities and contracts.
 ARGENT, NITRAS, CRYSTALS.—1s. 1d. per oz.
 ATROPHINE SULPHATE.—7s. to 7s. 6d. per oz., according to quantity.
 BARBITONE.—5s. 9d. to 6s. per lb.
 BENZONAPHTHOL.—2s. 10d. per lb.
 BISMUTH CARBONATE.—6s. 9d. per lb.
 BISMUTH CITRATE.—8s. per lb.
 BISMUTH SALICYLATE.—7s. 3d. per lb.
 BISMUTH SUBNITRATE.—6s. per lb.
 BISMUTH NITRATE.—Cryst. 5s. per lb.
 BISMUTH OXIDE.—9s. 10d. per lb.
 BISMUTH SUBCHLORIDE.—9s. 7d. per lb.
 BISMUTH SUBGALLATE.—7s. 3d. per lb. Extra and reduced prices for smaller and larger quantities of all bismuth salts respectively.
 BISMUTH ET AMMON LIQUOR.—Cit. B.P. in W. Qts. 1s. 0½d. per lb.; 12 W. Qts. 11½d. per lb.; 36 W. Qts. 11d. per lb. Liquor Bismuth B.P., in W. Qts., 1s. 2d. per lb.; 6 W. Qts., 11½d. per lb.; 12 W. Qts., 10d. per lb.; 36 W. Qts., 9½d. per lb.
 BORAX B.P.—Crystal, £21 10s. per ton; powder, £22 per ton; for one-ton lots and upwards. Packed in 1-cwt. bags carriage paid any station in Great Britain.
 BROMIDES.—Ammonium, 1s. 9d. per lb.; potassium, 1s. 4½d. per lb.; granular, 1s. 5d. per lb.; sodium, 1s. 7d. per lb. Prices for 1-cwt. lots.
 CAFFEIN, PURE.—6s. 6d. per lb.
 CAFFEIN CITRAS.—5s. per lb.
 CALCIUM LACTATE.—B.P., 1s. 1½d. to 1s. 3d. per lb., according to quantity.
 CAMPHOR.—Refined flowers, 2s. 10d. to 3s. per lb., according to quantity; also special contract prices.
 CHLORAL HYDRATE.—2s. 11½d. to 3s. 1½d. per lb.
 CHLOROFORM.—2s. 3d. per lb., according to quantity.
 EPHEDRINE, PURE.—12s. 6d. to 13s. 6d. per oz.
 ERGOSTEROL.—2s. 6d. per gm.
 ETHERS.—S.G. 730—1s. to 1s. 1d. per lb., according to quantity; other gravities at proportionate prices.
 FORMALDEHYDE, 40%.—30s. per cwt., in barrels, ex wharf.
 GLUCOSE, MEDICINAL.—1s. 6d. to 2s. per lb. for large quantities.
 HEXAMINE.—1s. 10d. to 2s. per lb., according to quantity.
 HYDROGEN PEROXIDE (12 VOLS.).—1s. 4d. per gallon, f.o.r. makers' works, naked. B.P., 10 vols., 2s. to 2s. 3d. per gall.; 20 vols., 3s. per gall.
 HYDROQUINONE.—3s. 9d. to 4s. per lb., in cwt. lots.
 HYPOPHOSPHITES.—Calcium, 2s. 11d. to 3s. 4d. per lb.; potassium, 3s. 2d. to 3s. 7d. per lb.; sodium, 3s. 1d. to 3s. 6d. per lb.; for 28-lb. lots.
 IRON AMMONIUM CITRATE.—B.P., 1s. 11d. per lb., for 28-lb. lots. Green, 2s. 6d. per lb., list price. U.S.P., 2s. 9d. per lb. list price.
 IRON PERCHLORIDE.—18s. to 20s. per cwt., according to quantity.
 IRON QUININE CITRATE.—B.P., 8½d. to 8½d. per oz., according to quantity.
 MAGNESIUM CARBONATE.—Light B.P., 36s. per cwt.
 MAGNESIUM OXIDE.—Light Commercial, £62 10s. per ton, less 2½%; Heavy commercial, £21 per ton, less 2½%; in quantity lower; Heavy Pure, 2s. to 2s. 3d. per lb.
 MENTHOL.—A.B.R. recrystallised B.P., 14s. 6d. per lb. net; Synthetic, 8s. 6d. to 12s. per lb.; Synthetic detached crystals, 8s. 6d. to 10s. per lb., according to quantity; Liquid (95%), 9s. per lb.
 MERCURIALS B.P.—Up to 1-cwt. lots, Red Oxide, crystals, 8s. 4d. to 8s. 5d. per lb., levig., 7s. 10d. to 7s. 11d. per lb.; Corrosive Sublimate, Lump, 6s. 7d. to 6s. 8d. per lb., Powder, 6s. to 6s. 1d. per lb.; White Precipitate, Lump, 6s. 9d. to 6s. 10d. per lb., Powder, 6s. 10d. to 6s. 11d. per lb., Extra Fine, 6s. 11d. to 7s. per lb.; Calomel, 7s. 2d. to 7s. 3d. per lb.; Yellow Oxide, 7s. 8d. to 7s. 9d. per lb.; Persulph, B.P.C., 6s. 11d. to 7s. per

lb.; Sulph. nig., 6s. 8d. to 6s. 9d. per lb. Special prices for larger quantities.

METHYL SALICYLATE.—1s. 3d. to 1s. 5d. per lb.
 PARAFORMALDEHYDE.—1s. 6d. per lb.
 PARALDEHYDE.—1s. 1d. per lb.
 PHENACETIN.—3s. 9d. to 4s. 1d. per lb.
 PHENOLPHTHALEIN.—5s. to 5s. 2½d. per lb.
 POTASSIUM BITARTRATE 99/100% (Cream of Tartar).—82s. per cwt., less 2½ per cent.
 POTASSIUM CITRATE.—B.P., 1s. 9d. per lb. for 28-lb. lots.
 POTASSIUM FERRICYANIDE.—1s. 7½d. per lb., in 125-lb. kegs.
 POTASSIUM IODIDE.—16s. 8d. to 17s. 9d. per lb., as to quantity.
 POTASSIUM METABISULPHITE.—50s. per cwt. d/d London, kegs free.
 POTASSIUM PERMANGANATE.—B.P. crystals, 5½d. per lb., spot.
 QUININE SULPHATE.—1s. 8d. per oz. for 1,000-oz. lots.
 SACCHARIN.—43s. 6d. per lb.
 SALICIN.—16s. 6d. to 17s. 6d. per lb., according to quantity.
 SANTONIN.—£50 per kilo for 5-kilo lots.
 SILVER NITRATE.—10d. per oz. for 500-oz. lots, sticks, 2d. per oz. extra.
 SODIUM BARBITONUM.—8s. 6d. to 9s. per lb. for 1-cwt. lots.
 SODIUM BENZOATE B.P.—1s. 6½d. to 1s. 7½d. per lb.
 SODIUM CITRATE.—B.P.C. 1911, 1s. 6d. per lb. B.P.C. 1923, and U.S.P., 1s. 10d. per lb. for 28-lb. lots.
 SODIUM HYPOSULPHITE, PHOTOGRAPHIC.—£15 per ton, d/d consignee's station in 1-cwt. kegs.
 SODIUM NITROPRUSSIDE.—16s. per lb.
 SODIUM POTASSIUM TARTRATE (ROCHELLE SALT).—75s. per cwt. net, ton lots, d/s of 5 cwt. Crystals, 2s. 6d. per cwt. extra.
 SODIUM SALICYLATE.—Powder, 1s. 10d. to 2s. 2d. per lb. Crystals, 1s. 11d. to 2s. 3d. per lb.
 SODIUM SULPHIDE, PURE RECRYSTALLISED.—10d. to 1s. 2d. per lb.
 SODIUM SULPHITE, ANHYDROUS.—£26 to £28 per ton according to quantity. Delivered U.K.
 STRYCHNINE, ALKALOID CRYSTAL, 2s. per oz.; hydrochloride, 1s. 9½d. per oz.; nitrate, 1s. 8d. per oz.; sulphate, 1s. 9d. per oz., for 1,000-oz. quantities.
 TARTAR EMETIC, B.P.—Crystal or powder, 1s. 9d. to 2s. per lb.
 THYMOL.—Puriss., 6s. 1½d. to 7s. per lb., according to quantity. Natural, 12s. per lb.

Perfumery Chemicals

ACETOPHENONE.—7s. per lb.
 AUBEPINE (EX ANETHOL).—9s. per lb.
 AMYL ACETATE.—2s. 3d. per lb.
 AMYL BUTYRATE.—4s. 9d. per lb.
 AMYL CINNAMIC ALDEHYDE.—9s. per lb.
 AMYL SALICYLATE.—2s. 6d. per lb.
 ANETHOL (M.P. 21/22°C.).—5s. per lb.
 BENZALDEHYDE FREE FROM CHLORINE.—2s. 6d. per lb.
 BENZYL ACETATE FROM CHLORINE-FREE BENZYL ALCOHOL.—1s. 9d. per lb.
 BENZYL ALCOHOL FREE FROM CHLORINE.—1s. 9d. per lb.
 BENZYL BENZOATE.—2s. 2d. per lb.
 CINNAMIC ALDEHYDE NATURAL.—11s. 9d. per lb.
 COUMARIN.—12s. per lb.
 CITRONELLOL.—6s. 6d. per lb.
 CITRAL.—6s. 6d. per lb.
 ETHYL CINNAMATE.—6s. 9d. per lb.
 ETHYL PHTHALATE.—2s. 6d. per lb.
 EUGENOL.—8s. 6d. per lb.
 GERANIOL.—6s. to 10s. per lb.
 HELIOTROPINE.—5s. 6d. per lb.
 ISO EUGENOL.—10s. 6d. per lb.
 LINALYL ACETATE, EX BOIS DE ROSE.—7s. 6d. per lb. Ex Shui Oil, 7s. 6d. per lb.
 METHYL ANTHRANILATE.—6s. 3d. per lb.
 METHYL BENZOATE.—4s. 3d. per lb.
 MUSK XYLOL.—6s. 6d. per lb.
 PHENYL ETHYL ACETATE.—10s. per lb.
 PHENYL ETHYL ALCOHOL.—8s. 3d. per lb.
 RHODINOL.—40s. per lb.
 SAFROL.—1s. 6d. per lb.
 VANILLIN, EX CLOVE OIL.—14s. 6d. to 16s. 6d. per lb. Ex Guaiacol.—13s. to 15s. per lb.

Essential Oils

ANISE OIL.—2s. 6d. per lb.
 BERGAMOT OIL.—8s. 3d. per lb.
 BOURBON GERANIUM OIL.—18s. per lb.
 CAMPHOR OIL.—White, 2s. per lb.; Brown, 1s. 6d. per lb.
 CANANGA.—Java, 8s. per lb.
 CINNAMON OIL LEAF.—4s. 6d. per oz.
 CITRONELLA OIL.—Java, 2s. 3d. per lb., c.i.f. Pure Ceylon, 2s. 1d. per lb.
 CLOVE OIL, 90/92%.—6s. 6d. per lb.
 EUCALYPTUS OIL, AUSTRALIAN, B.P. 70/75%.—1s. 7d. per lb.
 LAVENDER OIL.—Mont Blanc, 38/40%, 9s. per lb.
 LEMON OIL.—4s. per lb.
 OTTO OF ROSE.—Anatolian, 45s. per oz.; Bulgarian, 65s. per oz.
 PALMA ROSA.—9s. 6d. per lb.
 PEPPERMINT OIL.—Wayne County, 8s. 6d. per lb.

London Chemical Market

The following notes on the London Chemical Market are specially supplied to THE CHEMICAL AGE by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing these firms' independent and impartial opinions.

London, May 21, 1931.

PRICES on the whole remain steady and a fair amount of business has been booked during the current week. Export business is also a little brighter.

General Chemicals

ACETONE.—Unchanged and firm at £60 to £65 per ton according to quantity, with a satisfactory demand.
ACID ACETIC.—£39 5s. to £38 5s. per ton for technical 80% and £37 5s. to £39 5s. per ton for pure 80% according to quantity, with a steady demand.
ACID CITRIC.—Remains quiet at about 1s. 0½d. per lb., less 5%.
ACID FORMIC.—£38 per ton, and the improved demand continues.
ACID LACTIC.—£39 per ton for 50% by weight pale technical quality, with a fair demand.
ACID OXALIC.—Firm at £30 7s. 6d. to £32 per ton, according to quantity, and in good demand.
ACID TARTARIC.—Easy at about 11½d. per lb., less 5%.
ALUMINA SULPHATE.—Unchanged at £7 15s. to £8 5s. per ton for the 17 18% iron free quality.
ARSENIC.—Unchanged at £19 to £19 10s. per ton.
CREAM OF TARTAR.—In a little better demand at about 80s. to 81s. per cwt., ex warehouse London.
COPPER SULPHATE.—About £21 to £21 10s. per ton, less 5%, free on rails London.
FORMALDEHYDE.—£29 per ton, and in good demand.
LEAD ACETATE.—There is an improved demand at about £32 5s. per ton for white, and £31 5s. per ton for brown.
LEAD NITRATE.—Quiet at £28 10s. per ton.
LITHOPONE.—£18 to £22 per ton, according to quantity and grade.
POTASSIUM BICHROMATE.—Unchanged and firm at 4½d. per lb., with a steady demand.
POTASSIUM CHLORATE.—Continues firm at £28 to £32 per ton, according to quantity.
PERMANGANATE OF POTASH.—5½d. to 5½d. per lb., ex warehouse, for needle crystals B.P. and in steady request.
SODIUM BICHROMATE.—Unchanged and firm at 3½d. per lb., with discounts for contracts and in good demand.
SODIUM HYPOSULPHITE.—Photographic crystals are in good request at £14 5s. per ton; commercial is rather quiet at about £8 10s. per ton.

Nitrogen Fertilisers

Sulphate of Ammonia.—Export.—The market continues steady, with small buying for prompt requirements. Prices remain unchanged at £7 per ton f.o.b. U.K. port in single bags, for neutral quality 20.6% nitrogen. *Home.*—There is still a fair demand in the north, but merchants in the south report that buying has practically finished for the season. It is understood that the consumption will show a fall of about 15% on that of 1929/30.

Nitrate of Soda.—The nitrate of soda sales have been well maintained during the spring, and the fall on last year's consumption will not be as great as anticipated. The scale prices remain in operation in North European countries.

Latest Oil Prices

LONDON, May 20.—LINSEED OIL was firm and 5s. to 2s. 6d. per ton higher. Spot, ex mill, £16; May, £14 7s. 6d.; June-August, £14 12s. 6d.; and September-December, £15 7s. 6d., naked. RAPE OIL was inactive. Crude, extracted, £28; technical refined, £29 10s., naked, ex wharf. COTTON OIL was weak and a further 10s. per ton lower. Egyptian, crude, £18 10s.; refined common edible, £22; and deodorised, £24, naked, ex mill. TURPENTINE was steady, unchanged. American, spot and June, 43s.; July-December, 42s. 3d. per cwt.

HULL.—LINSEED OIL.—Spot and May, £15; July-August, £15 2s. 6d.; September-December, £15 5s. per ton, naked. COTTON OIL.—Bombay, crude, spot, £17 10s.; Egyptian, black, spot, £18; edible, refined, spot, £20 10s.; technical, spot, £20; deodorised, £22 10s. per ton. CASTOR OIL.—Pharmacy, spot, 40s.; first, 35s.; second, 33s. per cwt. GROUNDNUT OIL.—Crushed, extracted, spot, £23 10s.; deodorised, £27 10s. per ton. PALM KERNEL OIL.—Crude, f.m.q., spot, £20 per ton, naked. SOYA OIL.—Crushed, extracted, spot, £18; deodorised, £21 10s. per ton. RAPE OIL.—Crushed, extracted, spot, £27 10s.; refined, £29 10s. per ton. COD OIL 20s. per cwt. TURPENTINE, 45s. 3d. per cwt.

South Wales By-Products

THERE is scarcely any change in South Wales by-product activities. The demand for pitch remains slow and uncertain, with quotations unchanged. Supplies are well in excess of demands. Road tar has a

SODIUM PRUSSATE.—Firm at 4½d. to 5½d. per lb.
TARTAR EMETIC.—Steady at 10½d. per lb.
ZINC SULPHATE.—Unchanged at about £11 per ton.

Coal Tar Products

THERE is nothing fresh to report in the coal tar products market, prices remaining unaltered from last week.

MOTOR BENZOL.—Obtainable at 1s. 4½d. to 1s. 5½d. per gallon f.o.r.
SOLVENT NAPHTHA.—Remains at 1s. 1½d. to 1s. 2d. per gallon f.o.r.
HEAVY NAPHTHA.—Quoted at 11d. to 1s. 0½d. per gallon f.o.r.
CREOSOTE OIL.—Remains at about 3d. to 3½d. per gallon f.o.r. in the North, and at 4d. to 4½d. per gallon in London.
CRESYLIC ACID.—Unchanged at about 1s. 8d. per gallon for the 98 100% quality, and at about 1s. 6d. per gallon for the dark quality 95 97%.
NAPHTHALENES.—Quoted at £3 10s. to £3 15s. per ton for the fire-lighter quality, at £4 to £4 5s. per ton for the 74/76 quality, and at about £5 per ton for the 76/78 quality.
PITCH.—Remains weak for forward delivery, at 35s. to 37s. 6d. per ton, f.o.b. East Coast port.

THE following additional note on prices has been received:—

CARBOLIC ACID.—Market is steady, prices are unchanged at five-ton lots, 5½d.; smaller quantities at 6½d. per lb. in 3 cwt. drums, smaller packing extra.
ASPIRIN.—The volume of business at this time of the year is satisfactory; previous quotations are unchanged at 2s. 7d. to 2s. 9d. per lb. Prices are well maintained.
VANILLIN.—While material in seconds hands is still in evidence, supplies are not thought to be extensive. The new prices for guaiacol and clove oil vanillin are becoming operative.
SOLVENT NAPHTHA, 90/100.—To-day's price is 1s. 2½d. to 1s. 3d.; at works; the market is steady.
MOTOR BENZOL.—In the north is quoted at 1s. 5½d. to 1s. 5½d., naked, f.o.r.
CRESYLIC ACID.—There is a fair amount of inquiry with encouragement to look further ahead. Prices are steady: pale 99 100%, 1s. 10d. to 2s.; 97/99%, 1s. 6d. to 1s. 7d.; dark, 95%, 1s. 5d., per gallon; prices naked at works.

slightly better call, with prices steady round about 13s. per 40-gallon barrel. Refined tars are also in slightly better request, with quotations unchanged for coke-oven and gasworks tar. There is a slightly better call for solvent naphtha, but heavy naphtha has practically no market. Quotations are unchanged. Motor benzol is in fair request, but creosote is weak. Patent fuel and coke exports are unsatisfactory. Patent fuel prices, for export, are: 20s. 6d. to 21s., ex-ship Cardiff; 19s. 6d. to 20s., ex-ship Swansea. Coke prices are: Best foundry, 34s. to 36s. 6d.; good foundry, 22s. 6d. to 25s., furnace, 16s. 6d. to 17s. 6d.

Scottish Coal Tar Products

WITH a slightly increased demand for various by-products, some distillers are firmer in their ideas. Buying is spasmodic.

Creasylic Acid.—Few orders are being placed and values are unchanged. Pale, 99/100%, 1s. 4½d. to 1s. 5½d. per gallon; pale, 97/99%, 1s. 2½d. to 1s. 3½d. per gallon; dark, 97/99%, 1s. 1½d. to 1s. 2½d. per gallon; high boiling, 1s. 8d. to 1s. 9d. per gallon; all f.o.r. in bulk.

Carbolic Sixties.—Value is nominal at 1s. 2d. to 1s. 4d. per gallon, according to percentage of water.

Creosote Oil.—There is a regular business being conducted in the best grades. Specification oils, 2½d. to 3d. per gallon; gas works ordinary, 3½d. to 3½d. per gallon; washed oil, 3½d. to 3½d. per gallon; all f.o.r. in bulk.

Coal Tar Pitch.—With business at a standstill prices are nominal at about 37s. 6d. per ton f.a.s. Glasgow for export, and 37s. 6d. per ton f.o.r. works for home trade, both in bulk.

Blast Furnace Pitch.—Quiet, at controlled prices of 30s. per ton f.o.r. works for home trade; 35s. per ton f.a.s. Glasgow, export.

Refined Coal Tar.—Some export business is on the market, but quotations remain easy at 2½d. to 2½d. per gallon, filled into buyers' packages at makers' works.

Blast Furnace Tar.—Unchanged at 2½d. per gallon, f.o.r.

Crude Naphtha.—Production is low and value is steady at 4½d. to 5½d. per gallon, f.o.r. in bulk.

Water White Products.—Conditions remain dull and prices are irregular. Motor benzol is about 1s. 4d. to 1s. 5d. per gallon; 90/100 solvent, 1s. 3d. to 1s. 4d. per gallon; 90/100 heavy solvent, 1s. 1d. to 1s. 2d. per gallon; all f.o.r. makers' works.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to THE CHEMICAL AGE by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing this firm's independent and impartial opinions.

Glasgow, May 19, 1931.

THE Scottish heavy chemical market continues to show improvement.

Industrial Chemicals

- ACETONE.**—B.G.S.—£60 to £63 per ton, ex wharf, according to quantity.
- ACID, ACETIC.**—Prices ruling are as follows: glacial, 98/100%, £47 to £58 per ton; pure, £37 5s. per ton; technical, 80%, £36 5s., delivered in minimum lots of 1 ton.
- ACID, BORIC.**—Granulated commercial, £22 per ton; crystals, £23 per ton; B.P. crystals, £31 per ton; B.P. powder, £32 per ton, in 1-cwt. bags, delivered Great Britain free in one-ton lots upwards.
- ACID, HYDROCHLORIC.**—Usual steady demand. Arsenical quality, 4s. per carboy. Dearsenicated quality, 5s. per carboy, ex works, full wagon loads.
- ACID, NITRIC, 80° QUALITY.**—£23 per ton, ex station, full truck loads.
- ACID, OXALIC.**—98/100%.—On offer at 3½d. per lb., ex store. On offer from the Continent at 3½d. per lb., ex wharf.
- ACID, SULPHURIC.**—£3 7s. 6d. per ton, ex works, for 144° quality £5 15s. per ton for 168°. Dearsenicated quality, 20s. per ton extra.
- ACID, TARTARIC, B.P. CRYSTALS.**—Quoted 1s. per lb., less 5%, ex wharf. On offer for prompt delivery from the Continent at 1½d. per lb., less 5%, ex wharf.
- ALUMINA SULPHATE.**—Quoted round about £8 10s. per ton, ex store.
- ALUM, LUMP POTASH.**—Now quoted £8 10s. per ton., c.i.f. U.K. ports. Crystal meal, about 2s. 6d. per ton less.
- AMMONIA ANHYDROUS.**—Quoted 10½d. per lb., containers extra and returnable.
- AMMONIA CARBONATE.**—Lump quality quoted £36 per ton. Powdered, £38 per ton, packed in 5 cwt. casks, delivered U.K. stations or f.o.b. U.K. ports.
- AMMONIA LIQUID, 80°.**—Unchanged at about 2½d. to 3d. per lb., delivered, according to quantity.
- AMMONIA MURIATE.**—Grey galvanisers' crystals of British manufacture quoted £21 to £22 per ton, ex station. Fine white crystals offered from the Continent at about £17 5s. per ton, c.i.f. U.K. ports.
- ANTIMONY OXIDE.**—Spot material obtainable at round about £24 per ton, ex wharf. On offer for shipment from China at about £23 per ton, c.i.f. U.K.
- ARSENIC, WHITE POWDERED.**—Quoted £22 10s. per ton, ex wharf. Spot material still on offer at £22 15s. per ton, ex store.
- BARIUM CHLORIDE.**—In good demand and price about £9 10s. per ton, c.i.f. U.K. ports. For Continental materials our price would be £8 10s. per ton, f.o.b. Antwerp or Rotterdam.
- BLEACHING POWDER.**—British manufacturers' contract price to consumers unchanged at £6 15s. per ton, delivered in minimum 4-ton lots. Continental now offered at about the same figure.
- CALCIUM CHLORIDE.**—Remains unchanged. British manufacturers' price, £4 15s. to £5 5s. per ton, according to quantity and point of delivery. Continental material on offer at £4 7s. 6d. per ton, c.i.f. U.K. ports.
- COPPERAS, GREEN.**—At about £3 15s. per ton, f.o.r. works, or £4 12s. 6d. per ton, f.o.b. U.K. ports.
- FORMALDEHYDE, 40%.**—Now quoted £30 10s. per ton, ex store. Continental on offer at about £29 per ton, ex wharf.
- GLAUBER SALTS.**—English material quoted £4 10s. per ton, ex station. Continental on offer at about £3 per ton, ex wharf.
- LEAD, RED.**—Price now £30 per ton, delivered buyers' works.
- LEAD, WHITE.**—Quoted £42 per ton, carriage paid.
- LEAD ACETATE.**—White crystals quoted round about £33 to £34 per ton c.i.f. U.K. ports. Brown on offer at about £1 per ton less.
- MAGNESITE, GROUND CALCINED.**—Quoted £9 10s. per ton, ex store.
- METHYLATED SPIRIT.**—Industrial quality 64 o.p. quoted 1s. 8d. per gallon, less 2½% delivered.
- POTASSIUM BICHROMATE.**—Quoted 4½d. per lb., delivered U.K. or c.i.f. Irish ports, with an allowance for contracts.
- POTASSIUM CARBONATE.**—Spot material on offer, £25 10s. per ton ex store. Offered from the Continent at £24 15s. per ton, c.i.f. U.K. ports.
- POTASSIUM CHLORATE, 99½/100% POWDER.**—Quoted £29 per ton ex store; crystals 30s. per ton extra.
- POTASSIUM NITRATE.**—Refined granulated quality quoted £20 17s. 6d. per ton, c.i.f. U.K. ports. Spot material on offer at about £20 10s. per ton ex store.
- POTASSIUM PERMANGANATE B.P. CRYSTALS.**—Quoted 5½d. per lb., ex wharf.
- POTASSIUM PRUSSIAN (YELLOW).**—Spot material quoted 7d. per lb. ex store. Offered for prompt delivery from the Continent at about 6½d. per lb. ex wharf.
- SODA CAUSTIC.**—Powdered 98/99%, £17 10s. per ton in drums, £18 15s. in casks. Solid 76/77% £14 10s. per ton in drums, £14 12s. 6d. per ton for 70/72% in drums; all carriage paid buyer's station, minimum four-ton lots; for contracts 10s. per ton less.
- SODIUM BICARBONATE.**—Refined recrystallised, £10 10s. per ton, ex quay or station. M.W. quality 30s. per ton less.
- SODIUM BICHROMATE.**—Quoted 3½d. per lb., delivered buyer's premises, with concession for contracts.
- SODIUM CARBONATE (SODA CRYSTALS).**—£5 to £5 5s. per ton, ex quay or station; powdered or pea quality, 7s. 6d. per ton extra. Light soda ash, £7 13s. per ton, ex quay, minimum four-ton lots, with various reductions for contracts.
- SODIUM HYPOSULPHITE.**—Large crystals of English manufacture quoted £9 2s. 6d. per ton, ex station, minimum four-ton lots. Pea crystals on offer at £15 per ton, ex station, minimum four-ton lots.
- SODIUM NITRATE.**—Chilean producers now offer at £10 per ton, carriage paid, buyer's sidings, minimum six-ton lots.
- SODIUM PRUSSIAN.**—Quoted 5½d. per lb., ex store. On offer at 5d. per lb., ex wharf, to come forward.
- SODIUM SULPHATE (SALTCAKE).**—Price, 60s. per ton, ex works; 65s. per ton, delivered, for unground quality. Ground quality 2s. 6d. per ton extra.
- SODIUM SULPHIDE.**—Prices for home consumption: solid 61/62%, £10 per ton; broken, 60/62%, £11 per ton; crystals 30/32%, £8 2s. 6d. per ton, delivered buyers' works on contract, minimum four-ton lots. Special prices for some consumers. Spot material 5s. per ton extra.
- SULPHUR.**—Flowers, £12 per ton; roll, £10 10s. per ton; rock, £9 5s. per ton; ground American, £8 10s. per ton, ex store.
- ZINC CHLORIDE 98%.**—British material now offered at round about £18 10s. per ton, f.o.b. U.K. ports.
- ZINC SULPHATE.**—Quoted £11 per ton, ex wharf.

NOTE.—The above prices are for bulk business and are not to be taken as applicable to small parcels.

Proprietary Smokeless Fuel

Trade Mark Dispute

IN the Chancery Division on Tuesday last, May 19, Mr. Justice Maugham had before him an appeal, under the Trade Mark Acts, against a decision of the Assistant Comptroller of Patents concerning smokeless fuel.

The appellants, Low Temperature Carbonisation, Ltd., of Grosvenor Place, London, and Barugh, near Barnsley, opposed an application by the respondents, Magdalena Securities, Ltd., a Canadian company, with works at Cannock, Staffs, to register the word "Ucolite" to describe their smokeless fuel. The Assistant Comptroller decided that the registration should proceed. The appellants stated that for some years they had used the registered name "Coalite" for their smokeless fuel, and they contended that the adoption of the name Ucolite was likely to confuse the public and injure their business. This was denied.

Mr. Whitehead, K.C., and Mr. Bevan appeared for the Low Temperature Co., and Mr. G. Tookey represented the Magdalena Securities.

His lordship, after hearing evidence and long legal arguments, said he had had before him a mass of evidence which was not before the Assistant Comptroller when he gave his decision, and he had to exercise his discretion having regard to the evidence given before him. The onus was on the respondents to show that the mark should not be registered. He had had evidence that orders were commonly given by servants over the telephone. His lordship said he had no intention to give the opponents any monopoly or use of the word coal. But the word coal was altered very much when it was turned into coalite, and he came to the conclusion that coalite in truth was now a word distinctive of the goods put upon the market by the opponents. It had been used for years. Coalite was not at all like Ucolite and he could not conceive any educated man confusing one for the other as written. But, when spoken, they were less distinctive, and might lead to regrettable mistakes, when spoken by servants or given over the telephone. In all the circumstances he found in favour of the appellants. The decision of the Assistant Comptroller was accordingly reversed, with costs.

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Manchester Chemical Market

[FROM OUR OWN CORRESPONDENT.]

Manchester, May 21, 1931.

THE general tone of the chemical market, especially of the heavy products, has been steady during the past week, and instances of actual weakening have been few and far between. With regard to buying interest in chemicals, users are, for the most part, limiting current commitments to relatively small parcels, without going too far ahead from the point of view of delivery dates, although, on the whole, the textile finishing trades seems to be rather better situated than they were a month ago. To-morrow will probably see the end of serious business for a period of ten days or so, for most houses in the city will be closed for the greater part of the week.

Heavy Chemicals

The demand for saltcake has been of moderate extent, with values more or less maintained in the neighbourhood of £3 per ton. A quiet business has been reported in the case of prussiate of soda, but quotations are firm at from 4½d. to 5½d. per lb., according to quantity. Chlorate of soda has met with some inquiry, and there has been no change on balance in the price position, current offers being at round £26 5s. per ton. There is a moderate call for hyposulphite of soda at about £15 5s. per ton for the photographic grade and £9 for the commercial material. A quietly steady trade is passing in bichromate of soda and quotations are well held on the basis of 3½d. per lb., less 1 to 2½%, according to quantity. Not much business has been reported this week in the case of diphosphate of soda, values of which range from about £10 to £10 10s. per ton. Caustic soda is in fair request, and prices are firm on a contract basis of £12 15s. to £14 per ton, according to quality. Sulphide of sodium is in quiet demand, with offers of the 60-65% concentrated solid grade at from £9 to £9 5s. per ton and the commercial product at round £8. There is a quietly steady demand about for alkali and values in this section are firm in the neighbourhood of £6 per ton. Bicarbonate of soda is in moderate inquiry and prices keep up at round £10 10s. per ton.

Inquiry for carbonate of potash has not been very extensive, but quotations are pretty much as before at about £25 per ton. Caustic potash is fairly steady at £28 10s. per ton, with a quiet demand reported. Yellow prussiate of potash is firm at from 6½d. to 7½d. per lb., according to quantity, a moderate business in this material being put through. Chlorate of potash has been moving this week in relatively small quantities with offers at £27 10s. per ton. The demand for permanganate of potash is on rather quiet lines, but values keep up at about 5½d. per lb. for the B.P. material, and 5½d. for the commercial product. Bichromate of potash is steady and in moderate request at 4½d. per lb., less 1 to 2½ per cent.

Comparatively little buying interest is being displayed just now in sulphate of copper, the price position of which is weak at no more than £19 per ton, f.o.b. Firmness continues to characterise the arsenic section, from £19 5s. to 19 10s. per ton, at the mines, for white powdered, Cornish makes, being currently quoted. Sales of acetate of lime are slow but there has been no further easing of prices, the grey material being on offer at about £12 to £12 10s. per ton and the brown at £7 5s. There is only a quiet movement of the lead products, and a certain amount of easiness is still in evidence; nitrate is quoted at round £29 per ton, and white and brown acetate at about £32 and £31.

Acids and Tar Products

Oxalic acid is fairly steady at up to £1 12s. per cwt., ex store, a moderate inquiry being reported. There is a fair movement of acetic acid, and values are firm at £37 per ton for the 80% commercial quality and £51 for the technical glacial. Tartaric acid is in quiet demand, but prices are held at round 11½d. per lb. Inquiry for citric acid this week has been on quiet lines, with offers at from 18s. to 18s. 0½d. per lb.

The coal-tar by-products are quiet in most sections, with pitch nominal at about 37s. per ton, f.o.b., creosote oil being quoted at from 3d. to 3½d. per gallon, naked, according to grade. Solvent naphtha keeps fairly steady at about 18s. 3d. per gallon, naked at works, a moderate business being put through. Carbollic acid is rather quiet at the moment, with crystals on offer at 5d. to 5½d. per lb., f.o.b., and 60's crude at 18s. 2d. per gallon, naked.

Company News

LEWIS BERGER AND SONS, LTD.—It is announced by the directors that no interim dividend will be paid on the ordinary shares in respect of the year ended July 31, 1931. Last year an interim of 5 per cent. was paid.

CROSFIELDS OIL AND CAKE CO.—The report for the year ended March 31, 1931, states that the net profits (after providing for all charges, 10 per cent. depreciation of plant, directors' fees and income tax) amount to £8,496. To this is added the amount brought forward £3,615, making £12,111, which the directors recommend be dealt with as follows: Dividend of 10 per cent. per annum, less tax £7,750, placed to staff reserve £1,000, carrying forward £3,361.

INTERNATIONAL NICKEL CO. OF CANADA.—A consolidated general profit and loss statement shows that the total income for the three months to March 31, 1931, amounts to \$3,254,381, against \$6,916,939 for the corresponding period of 1930. The net profit for the quarter was \$1,659,638, equivalent to 8 cents per share on the common stock, after allowing for preferred dividend, as compared with \$4,616,144, equal to 30 cents per common stock after allowing for preference dividend in 1930.

ZINC CORPORATION, LTD.—The directors announce that, after making provision to meet the fall in the value of stocks on hand at December 31 last, they are unable to recommend the payment of a final dividend in respect of 1930. The dividend on the cumulative preference shares for the half-year ending June 30 will be paid (less tax) on July 1 next in English currency to shareholders on both the English and Australian registers. The report will be issued towards the end of June, and the meeting will be held early in July.

NITRATE PRODUCERS' STEAMSHIP CO.—The accounts for the year ended April 30 last show a profit of £53,670, against £96,321 last year, to which must be added a balance brought forward, £15,472, making a total of £69,142. From this is deducted general expenses, directors' fees, income-tax, interest and interim dividend, amounting in all to £24,235, leaving £44,906. The directors propose a dividend at the rate of 7½ per cent. per annum, tax free, making 7½ per cent., and to place £24,000 to special emergency reserve account, leaving £15,045 to be carried forward.

NATIONAL DRUG AND CHEMICAL CO. OF CANADA.—The net revenue for the year to January 31, 1931, was \$87,931, the balance in profit and loss account being \$467,196. Reserves are as follows: Depreciation (buildings and plant) \$298,660, insurance \$56,077, against bad debts \$163,266. Net revenue is shown, after making provision to extent of \$25,300, for possible future loss from bad debts. Appraisal (\$1,496,826) company's warehouse properties made in 1930, shows balance sheet value for land and buildings to be conservatively stated. Revised valuations indicate surplus of \$38,000.

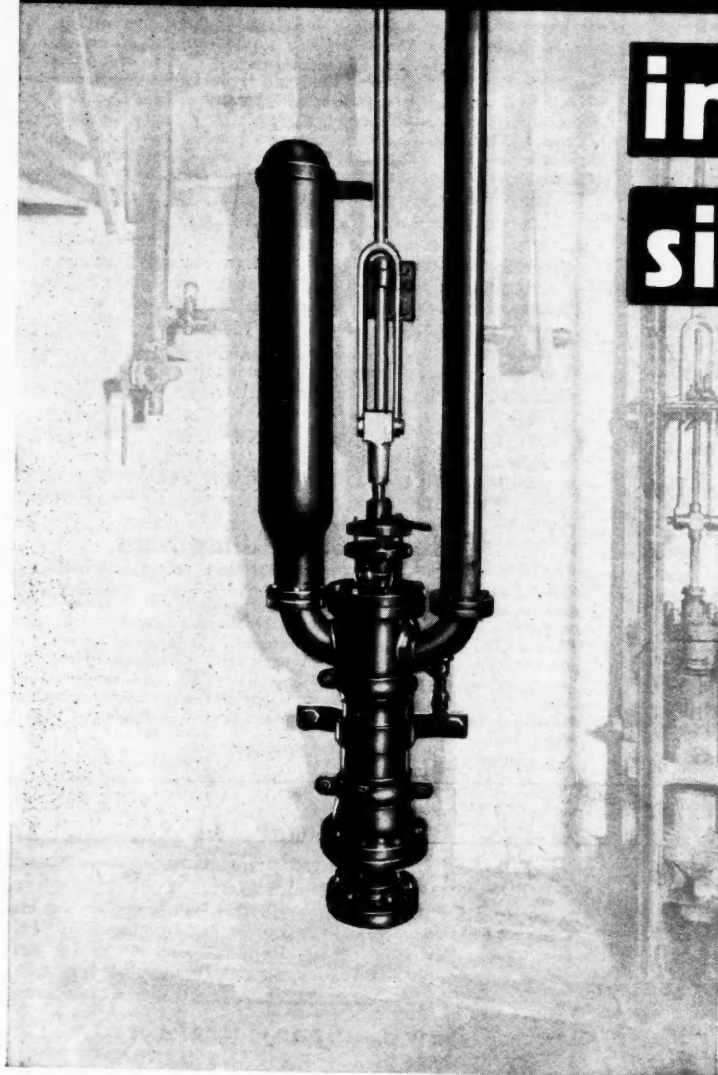
BRITISH COTTON AND WOOL DYERS' ASSOCIATION, LTD.—The profits for the year ended March 31, 1931, after charging administration expenses, £3,491 for specific depreciation and £42,523 for repairs and renewals, and also providing an estimated amount for other contingencies, amount to £55,007, compared with £117,227 in the previous year. The net profits for the period, which include £11,523 transferred from income-tax account and not now required, were £3,818, against £64,685, which sum it is proposed to carry forward. Last year a dividend of 7½ per cent. was paid.

B. LAPORTE, LTD.—The report of the directors to be submitted to the twenty-fourth general meeting of the shareholders to be held at the Luton Chamber of Commerce Room, 11, George Street West, Luton, on May 28, at 11.30 a.m., states that the profit and loss account for the year, after charging directors' fees and making adequate provision for depreciation and doubtful debts, shows a balance of profit amounting to £35,242. The net profit for the year was £35,242, to which is added the balance of profit and loss account brought forward from last account, £10,733. From this is deducted dividends on preference shares (already paid) for the year ended December 31, 1930, leaving £34,740, which it is proposed to allocate as follows:—To pay a dividend on the ordinary shares at the rate of 9 per cent. for the year ended March 31, 1931 (payable less income tax), £10,667; to transfer to reserve fund, £2,000; to transfer to investments reserve account, £2,500; to write off patents account, £1,000; to transfer to income tax suspense account, £7,000; to carry forward to next account, £11,573.

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"The Ebonite Pump has been in regular use since its installation in the year 1866. It is a single stroke pump, bore $4\frac{1}{2}$ " and stroke 12", driven up to a few years since by shafting from a steam engine, but now by electric power. It is used for pumping vinegar cold at one stage of its manufacture. It is in regular, but not continuous, use, though it often has to work for 48 hours or more without stopping, and, of course, has in its period of use pumped very many millions of gallons.

"Some small repairs have been needed at various periods, but these have had nothing to do with the design or wearing of the pump.

"About eight years ago we ordered another pump of exactly the same material and design, to be kept in readiness lest the old one should fail, but the new pump is still in store, and we really see no reason why the old one should not see further years of service."

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Acetate Products Action Amended Statement of Claim

In the King's Bench Division, on Friday, May 15, Mr. Justice MacKinnon had again before him the action by the Acetate Products Corporation, of Pontifex House, London, against Mr. Morris Greenhill, of Cleveland House, London, the case having been adjourned for the plaintiffs to amend their statement of claim.

Mr. Miller, K.C., for the defendant, now informed his lordship that the plaintiffs had debarred their amended statement of claim, and he submitted that they had gone far beyond the amendments which were forecast by his lordship or the leave that he had given. Counsel contended that part of the amended statement should be struck out. The action launched was one in which the Corporation claimed damages for breach of contract. As amended it introduced entirely new allegations of a most serious character, and involved a new case. The matter was of great importance to his client, and must not be rushed.

Mr. Stuart Bevan, K.C., for the Corporation, said the application was intended to delay further the hearing of the action. In order to avoid delay and any grievance by the other side, the plaintiffs had taken the trouble to set out certain things so that the defendant would know what he had to meet. Under the circumstances, he characterised the application as an idle one.

Mr. Miller said the application was not for the purpose of delay, but he thought that the defendant should have reasonable time to meet the serious case sprung upon him by the amendment.

His lordship said he did not think he could grant the application.

Mr. Miller said he gathered that his lordship would not strike out part of the amendment, and that the case was to go forward on the basis of the new pleadings.

His lordship said the matters spoken of were matters of discovery, and Mr. Bevan had stated that he had no further letters to discover.

Mr. Miller said he must raise strenuous objection to the case being rushed, having regard to its nature.

His lordship said the application failed and must be dismissed. He would not be able to hear the case further owing to his engagements, and application would have to be made to another judge to try the action.

Utilisation of Rice Hulls

ACCORDING to the *International Review of Agriculture*, which is published by the International Institute of Agriculture at Rome, the problem of the profitable utilisation of rice hulls is being considered in Italy. By dry distillation 60 per cent. of liquid products are obtained containing acetic and propionic acids, furfural, phenols and cresols, which can be separated and used. The coke obtained has a certain value as a decolourising char. The ash contains 3.15 per cent. K_2O and 93.95 per cent. SiO_2 . The value of rice hulls is recognised in the glass-making industry. Bacterial decomposition of the hulls with the formation of alcohol and inferior fatty acids constitutes another method of their utilisation.

Government Contracts in Argentina

A MEMORANDUM regarding the conditions governing the submission of tenders for Government contracts in the Argentine Republic, together with details of some of the special conditions applicable to tenders for certain of the Departments, has been prepared by the Commercial Counsellor to H.M. Embassy at Buenos Aires. Copies may be obtained on application to the Department of Overseas Trade, 35, Old Queen Street, London, S.W.1, quoting Ref. C.X. 3527.

Trade in Mexico

A MEMORANDUM on methods of trading and the appointment of agents in Mexico has been prepared by His Majesty's Consul-General at Mexico City. British firms desirous of obtaining a copy of this memorandum, together with particulars of the Special Register service of information, should apply to the Department of Overseas Trade, 35, Old Queen Street, London, S.W.1, quoting Ref. C.X. 3535.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

Mortgages and Charges

[NOTE.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.]

CONSOL PRODUCTS, LTD., Sunbury Common, manufacturers of essences, etc. (M., 23/5/31.) Registered May 5, charge, to Westminster Bank, Ltd., securing all moneys due or to become due to the Bank; charged on Sunbury Common Factory, etc. *£14,850. March 9, 1931.

METAFILTERS (1929), LTD., Hounslow. (M., 23/5/31.) Registered May 9, £11,800 and £250 debentures, part of £25,000 (not ex.); general charge (excluding Belgrave Mills and 2 and 4, Belgrave Road, Hounslow). *£6,463. December 25, 1930.

MORGAN DAVIS AND SONS, LTD., London, S.E., manufacturing chemists. (M., 23/5/31.) Registered May 8, £2,600 debenture, to T. C. Davis and wife, Sunnyside, Sudbrook Lane, Petersham; general charge. *—, September 18, 1930.

County Court Judgment

[NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.]

LATENT LABORATORIES, LTD., Willing House, 356-360, Gray's Inn Road, W.C., industrial chemists and engineers. (C.C., 23/5/31.) £14 10s. 6d. April 17.

London Gazette, &c.

Winding-Up Petition

BOLGAR OIL PROCESSES, LTD. (W.U.P., 23/5/31.) A petition for the winding-up of this company by the High Court of Justice, was, on May 8 presented by Harold Moore, of 181, Queen Victoria Street, London, and is to be heard at the Royal Courts of Justice, Strand, London, on June 8.

New Company Registered

SCOTTISH SODA CRYSTAL MANUFACTURERS' ASSOCIATION, LTD., 87, St. Vincent Street, Glasgow, C.2. Registered in Edinburgh on May 13. Nominal capital, £100 in £1 shares. Chemists, druggists, drysalts, oil and colourmen, etc. Directors: G. A. Grant, W. Gardiner, R. W. McAlley, D. A. Peebles, D. Willox.

Appointment of Agents Abroad

It has come to the notice of the Department of Overseas Trade that its Overseas officers are frequently placed in no inconsiderable difficulty when endeavouring, at the request of some United Kingdom firm, to interest a local firm in their productions. When only one set of literature is supplied on the occasion of a request for the name of a suitable agent, it is not an easy matter to get catalogues returned expeditiously from the firms which are approached, when these firms find they have no interest in the products put before them; in consequence, it is not possible to communicate with other firms, who might be interested, without considerable delay. In order to facilitate the establishment of connections, it is therefore suggested that any such requests should be accompanied by adequate literature, particulars of prices and terms, together with details of the basis on which it is proposed business should be conducted.

